CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0045
NPDES NO. CA0110299

WASTE DISCHARGE REQUIREMENTS FOR THE UNITED STATES AIR FORCE, BEALE AIR FORCE BASE WASTEWATER TREATMENT PLANT YUBA COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

1. The United States Air Force (hereafter Discharger) submitted a Report of Waste Discharge, dated 15 June 2003 and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the Beale Air Force Base (AFB) Wastewater Treatment Plant (WWTP). Supplemental information to complete filing of the application was submitted on 2 July 2003, 9 July 2003, and 8 August 2003.

2. Beale AFB includes 22,944 acres of land in the Sacramento Valley and the lower foothills of the Sierra Nevada Mountains. The military installation is located ten miles east of Marysville and 45 miles north of Sacramento. Beale AFB is divided into three distinct areas. The flight line area is located west of the Base and consists of runway, hangers, fuel supporting facilities, fire department, and shops that directly support the flying missions. The cantonment area is located in the Base's central region and comprises of Base support functions such as administrative buildings, recreational facilities, civil engineering, the commissary, and Base Exchange. The eastern portion of the Base includes Military Family Housing, the Base Hospital, and a ballistic missile radar detection system.

3. The Discharger owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to domestic and industrial users. The municipal wastewater treatment plant is in Section 4, T14N, R5E, MDB&M, as shown on Attachment A, a part of this Order. The effluent waste stream from the treatment plant is discharged to Hutchinson Creek (Outfall No. 001) at the point latitude 39º 5' 16" (degrees, minutes, seconds) and longitude 121º 25' 30". Hutchinson Creek enters the Western Pacific Interceptor Drainage Canal, which is tributary to the Bear River and the Feather River, waters of the United States. As an alternative to a surface water discharge, treated wastewater is also discharged to irrigate the Base golf course (Outfall No.002), which is located in Section 35, T15N, R5E, MDB&M, as shown on Attachment A, a part of this Order.

4. Wastewater effluent is discharged to a storage pond (Pond #4) and an associated 40-acre irrigation field and is currently regulated under separate Waste Discharger Requirements, Order No. 5-01-087. Pond #4 and the land application field were constructed for holding and disposal of wastewater when it is not needed for the Golf Course to maximize land disposal.

5. According to the Discharger, golf course irrigation is the highest priority use of the treated effluent, followed by the discharge to Pond #4, which has a capacity of 100 million gallons, and irrigation, with surface water disposal to Hutchinson Creek being the lowest priority. Since 21 February 2002, all wastewater has been routed to the Golf Course Pond or Pond #4 and there has been no discharge to Hutchinson Creek. Irrigation of the 120-acre golf course occurs while golfers are not on the course. The Golf Course Pond is located northeast of the wastewater treatment plant and to the west of the Golf Course. Golf Course irrigation tends to occur during the summer months. Discharge to Hutchinson Creek occurs primarily during the winter months. The reclamation discharge to irrigate the golf course is covered under this Order.

6. A significant source of influent flow to the wastewater treatment plant is from a treatment plant to remediate groundwater at Site 13, also known as Landfill #1. Contaminated groundwater, from Site 13, is treated by an air stripping process to remove trichloroethane (TCE) and other chlorinated hydrocarbons. The effluent waste stream from the wastewater and the groundwater treatment plants are commingled in an aeration pond prior to discharge to Hutchinson Creek. The Discharger has proposed removing the treated groundwater from the domestic wastewater system, which would necessitate separate Waste Discharge Requirements. This would facilitate additional capacity for land disposal of the domestic wastewater.

7. The domestic wastewater treatment system consists of a headworks, a primary clarifier, two trickling filters, a secondary clarifier, and a chlorination/dechlorination unit. Sludge removed by the WWTP is processed in two anaerobic digesters, dried in sludge drying beds, and disposed off-site.

8. The Report of Waste Discharge (RWD) and the supplemental information describe the wastewater discharge as follows:

Parameter - Constituent	Maximum Daily	Average Daily	Unit
Flow Rate	5.2	0.76	million gallons per day (mgd)
		5.0 (Design)	mgd
Temperature	80.6 (Summer) 73.4 (Winter)	71.6 (Summer) 57.2 (Winter)	°F
BOD[1]	25	8.0	mg/l
Total Suspended Solid	45	9.0	mg/l

Parameter - Constituent	Maximum Daily	Average Daily	Unit
Total Coliform Organisms	1,600	57	MPN /100 mL
Ammonia (as N)	6.0	2.1	mg/l
Chlorine Residual (Total)	0.57	0.06	mg/l
N-Hexane Extractable Material	11.0	0.711	mg/l
Total Dissolved Solids (TDS)	610	357	mg/l
Electrical Conductivity	720	513	µmhos/cm
Total Petroleum Hydrocarbons (as Diesel)	0.56	0.046	mg/l
MBAS	1.2	0.4	mg/l
Cadmium	5.0	1.1	µg/l
Mercury	0.5	0.11	µg/l
Copper	38	10.1	µg/l
Aluminum	71	37	µg/l
Chloroform	13	3.5	µg/l
Nitrate (as N)	68	29.6	mg/l
Nitrite (as N)	0.33	0.22	mg/l
Bis(2-ethylhexyl)phthalate	53	4.3	µg/l
Dichlorobromomethane	2.7	0.748	µg/l
Dibromochloromethane	0.89	0.168	µg/l
Iron	69	57	µg/l
Total Cyanide	37	5.5	µg/l

[1] 5-day, 20°C biochemical oxygen demand

9. The U.S. Environmental Protection Agency (EPA) and the Regional Board have classified this discharge as a major discharge.

10. The Regional Board adopted a *Water Quality Control Plan*, *Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

RECEIVING WATER BENEFICIAL USES

11. The Basin Plan at page II-2.00 states: "Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary

streams." The Basin Plan does not specifically identify beneficial uses for Hutchinson Creek, but the Basin Plan does identify present and potential uses for the Bear River, to which Hutchinson Creek, via the Western Pacific Interceptor Drainage Canal, is tributary.

The Basin Plan identifies the following beneficial uses for the Bear River: domestic and municipal supply, agricultural irrigation, agricultural stock watering, industry power supply, water contact recreation including canoeing and rafting recreation, non-contact water recreation including aesthetic enjoyment, warm and cold freshwater habitats, potential warm and cold fish migration habitat, potential warm and cold spawning habitat, and wildlife habitat. In addition, State Board Resolution No 88-63, incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056, requires the Regional Board to assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in Table II-1.

The Basin Plan on page II-1.00 states: "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning…" and with respect to disposal of wastewaters states that "...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses."

The federal Clean Water Act, Section 101(a)(2), states: "it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983." Federal Regulations, developed to implement the requirements of the Clean Water Act, create a rebuttable presumption that all waters be designated as fishable and swimable. Federal Regulations, 40 CFR Section 131.2 and 131.10, require that all waters of the State be regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. Section 131.3(e), 40 CFR, defines existing beneficial uses as those uses actually attained after November 28, 1975, whether or not they are included in the water quality standards. Federal Regulations, 40 CFR Section 131.10 requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for any waters of the United States.

In reviewing whether the existing and/or potential uses of the Bear River apply to Hutchinson Creek**,** the Regional Board has considered the following facts:

a. Municipal and Domestic Supply and Agricultural Irrigation

The Regional Board is required to apply the beneficial uses of municipal and domestic supply to Hutchinson Creek based on State Board Resolution No. 88-63 which was incorporated in the Basin Plan pursuant to Regional Board Resolution 89-056. In addition, the State Water Resources Control Board (SWRCB) has recorded water rights

for irrigations uses along Hutchinson Creek and water rights for irrigation uses, recreational uses, and fish and wildlife protection and/or enhancement along Western Pacific Interceptor Drainage Canal, downstream of the discharge. Riparian Rights, for landowners along streams and rivers, may not be recorded with the SWRCB. Regional Board staff observed homes and farms along the Bear River, which may use the water for domestic and irrigation purposes.

Hutchinson Creek is an ephemeral stream and provides groundwater recharge during periods of low flow. The groundwater is a source of drinking water and irrigation water.

b. *Water Contact and Non-contact Recreation (including canoeing, rafting, and aesthetic enjoyment)*

The WWTP discharges to Hutchinson Creek; Hutchinson Creek is tributary to the Western Pacific Interceptor Drainage Canal; and the Western Pacific Interceptor Drainage Canal flows to the Bear River and the Feather River. The Regional Board finds that there is ready public access to Hutchinson Creek, the Western Pacific Interceptor Drainage Canal, the Bear River, and the Feather River. Exclusion or restriction of public use is unrealistic. Regional Board staff observed evidence of contact recreational activities at the confluence of the Western Pacific Interceptor Drainage Canal and the Bear River; specifically, campfires, litter, foot trails, and numerous spent shotgun shells were observed along the banks. Downstream of the discharge, the Western Pacific Interceptor Canal runs through residential areas of the community of Olivehurst. Olivehurst is experiencing significant residential growth and contact recreational uses of the Western Pacific Interceptor Canal is likely to increase.

c. *Groundwater Recharge*

In areas where groundwater elevations are below the stream bottom, water from the stream will percolate to groundwater. During dry weather in many places in California, flowing streams experience these conditions, thus providing groundwater recharge. Since Hutchinson Creek is at times dry, it is reasonable to assume that the stream water is lost by evaporation, flow downstream and percolation to groundwater providing a source of municipal and irrigation water supply.

d. *Freshwater Replenishment*

When water is present in Hutchinson Creek, there is hydraulic continuity with the Western Pacific Interceptor Drainage Canal and the Bear River. During periods of hydraulic continuity, Hutchinson Creek adds to the water quantity and may impact the quality of water in the Western Pacific Interceptor Drainage Canal and the Bear River.

e. *Warm and Cold Freshwater Habitats (including preservation and enhancement of fish and invertebrates), Potential Warm and Cold Spawning Habitats, and Wildlife Habitat*

Hutchinson Creek flows to the Western Pacific Interceptor Drainage Canal, which is tributary to the Bear River. The Bear River flows to the Feather River. The California Department of Fish and Game (DFG) has recorded the presence of adult salmonids and juvenile non-natal rearing in Hutchinson Creek and the Western Pacific Interceptor Drainage Canal and anadromous fish species in Reeds Creek, a tributary to the Western Pacific Interceptor Drainage Canal. Regional Board staff observed the presence of fish at the Western Pacific Interceptor Drainage Canal and at the confluence of the Bear River and the Western Pacific Interceptor Drainage Canal. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l.

The Basin Plan (Table II-1) designates the Bear River as being both a cold and warm freshwater habitat. Pursuant to the Basin Plan Tributary Rule, the cold and warm water habitat designation is applied to Hutchinson Creek. Upon review of the flow conditions, habitat values, and beneficial uses of Hutchinson Creek, and the facts described above, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Bear River are applicable to Hutchinson Creek.

The Regional Board also finds that based on the available information, that Hutchinson Creek, absent the discharge, is an ephemeral stream. The ephemeral nature of Hutchinson Creek means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flows within Hutchinson Creek help support the aquatic life. Both conditions may exist within a short time span, where Hutchinson Creek would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Bear River. Dry conditions occur primarily in the summer months, but dry conditions may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water standards, agricultural water quality goals and aquatic life. Significant dilution may occur during and immediately following high rainfall events.

NARRATIVE OBJECTIVES

12. The federal Clean Water Act (CWA) mandates the implementation of effluent limitations that are as stringent 40 C.F.R., § 122.44(d)(1)) NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to Federal Regulations, 40 C.F.R. section 122.44(d)(1)(i), NPDES

permits must contain limits that control all pollutants that "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." Federal Regulations, 40 CFR, Section 122.44(d)(1)(vi), further provide that "[w]here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits."

13. The Regional Board's Basin Plan, page IV-17.00, contains an implementation policy ("Policy for Application of Water Quality Objectives") that specifies that the Regional Board "will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives." This Policy complies with 40 CFR 122.44(d)(1). With respect to narrative objectives, the Regional Board must establish effluent limitations using one or more of three specified sources, including EPA's published water quality criteria, a proposed state criterion (i.e., water quality objective), or an explicit state policy interpreting its narrative water quality criteria (i.e., the Regional Board's "Policy for Application of Water Quality Objectives")(40 C.F.R. 122.44(d)(1) (vi) (A), (B) or (C)). The Basin Plan contains a narrative objective requiring that: "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life". The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The beneficial uses include municipal and domestic supply, agricultural irrigation supply, water contact and non-contact recreation and aquatic habitat and migration. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that; to protect all beneficial uses the Regional Board may apply limits more stringent than MCLs. When a reasonable potential exists for exceeding a narrative objective, Federal Regulations mandate numerical effluent limitations and the Basin Plan narrative criteria clearly establish a procedure for translating the narrative objectives into numerical effluent limitations.

EFFLUENT LIMITATIONS AND REASONABLE POTENTIAL

14. The United States Environmental Protection Agency (U.S. EPA) adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State

Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan or SIP) that contains guidance on implementation of the NTR and the CTR.

15. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have a reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for the following constituents:

a) **Bis(2-ethylhexyl)phthalate**:

Analytical data provided by the Discharger indicate that bis(2-ethylhexyl)phthalate was detected in 39 of 56 effluent samples. Bis(2-ethylhexyl)phthalate was detected at a maximum concentration of 53 µg/l. U.S. EPA human health NTR criteria for bis(2-ethylhexyl)phthalate are 1.8 µg/l (for waters from which both water and aquatic organisms are consumed) and 5.9 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average. The maximum detected effluent concentration of bis(2-ethylhexyl)phthalate exceeds human health NTR criteria. Therefore, the discharge from the Beale AFB WWTP has a reasonable potential to cause or contribute to an exceedance of NTR criteria for bis(2-ethylhexyl)phthalate. Based on these considerations, this Order contains an average monthly concentration-based Effluent Limitation of 1.8 µg/l for bis(2-ethylhexyl)phthalate based on the human health NTR criterion. A time schedule has been included in this Order for compliance with the bis(2-ethylhexyl)phthalate limitation.

b) **Cadmium:**

Analytical data provided by the Discharger indicate that cadmium was detected in the effluent at a maximum concentration of 5.0 µg/l. Using the lowest measured hardness from the effluent of 100 mg/l, the CTR freshwater aquatic life hardness-dependent criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average) (presented in total concentrations) are calculated at 2.5 µg/l and 4.5 µg/l, respectively.

The maximum detected concentration of cadmium exceeds freshwater aquatic life CTR criteria. It indicates that the discharge from the Beale AFB WWTP does have a reasonable potential to cause or contribute to an exceedance of the CTR criteria for

cadmium. Therefore, Effluent Limitations for cadmium are included in this Order. A time schedule has been included in this Order for compliance with the cadmium limitation.

c) **Copper:**

Analytical data provided by the Discharger indicate that copper was detected in 37 of 64 effluent samples. The maximum detected effluent concentration of copper was 38 µg/l. The CTR freshwater aquatic life hardness-dependent criteria for copper are presented in dissolved concentrations. U.S. EPA recommended conversion factors to translate dissolved concentrations to total concentrations. The conversion factor for copper in fresh water is 0.960 for both acute and chronic criteria.

Using the lowest measured hardness from the effluent of 100 mg/l, the hardness-dependent criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average) for copper are calculated at 9.3 µg/l and 14 µg/l, respectively.

The maximum detected effluent concentration of copper exceeds freshwater aquatic life CTR criteria. Therefore, Effluent Limitations for copper are included in this Order and are based on freshwater aquatic life CTR criteria. A time schedule has been included in this Order for compliance with the copper limitation.

d) **Cyanide:**

Analytical data provided by the Discharger indicate that cyanide was detected in 20 of 65 effluent samples. The maximum detected effluent concentration of cyanide was reported at 37 µg/l. U.S. EPA human health CTR criteria for cyanide are 700 µg/l (for waters from which both water and aquatic organisms are consumed) and 220,000 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average. U.S. EPA established freshwater aquatic life NTR criteria for cyanide. The NTR freshwater aquatic life continuous concentration (four-day average) and the maximum concentration (one-hour average) criteria for cyanide are 5.2 µg/l and 22 µg/l, respectively.

The maximum detected concentration of cyanide exceeds freshwater aquatic life NTR criteria. Therefore, the discharge from the Beale AFB WWTP has a reasonable potential to cause or contribute to an exceedance of freshwater aquatic life NTR criteria for cyanide. Effluent Limitations for cyanide are included in this Order and are based on freshwater aquatic life NTR criteria. A time schedule has been included in this Order for compliance with the cyanide limitation.

e) **Bromodichloromethane:**

Analytical data provided by the Discharger indicate that bromodichloromethane was detected in the effluent at a maximum concentration of 2.7 µg/l. U.S. EPA human health CTR criteria for bromodichloromethane are 0.56 µg/l (for waters from which both water and aquatic organisms are consumed) and 46 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average.

The maximum detected concentration of bromodichloromethane exceeds the human health CTR criterion for waters from which both water and aquatic organisms are consumed. Therefore, the discharge from the Beale AFB WWTP has a reasonable potential to cause or contribute to an exceedance of the human health CTR criterion. Effluent Limitations for bromodichloromethane are included in this Order and are based on human health CTR criteria. A time schedule has been included in this Order for compliance with the bromodichloromethane limitation.

f) **Dibromochloromethane:**

Analytical data provided by the Discharger indicate that dibromochloromethane was detected in the effluent at a maximum concentration of 0.89 µg/l. U.S. EPA established human health CTR criteria of 0.41 µg/l (for waters from which both water and aquatic organisms are consumed) and 34 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average.

The maximum detected concentration of dibromochloromethane exceeds the human health CTR criterion for waters from which both water and aquatic organisms are consumed. Therefore, Effluent Limitations for dibromochloromethane are included in this Order. A time schedule has been included in this Order for compliance with the dibromochloromethane limitation.

g) **Mercury:**

Human health CTR criteria for mercury are 0.05 µg/l (for waters from which both water and aquatic organisms are consumed) and 0.051 µg/ (for waters from which only aquatic organisms are consumed) as a 30-day average. In 40 CFR Part 131, U.S. EPA acknowledges that human health criteria may not be protective of some aquatic or endangered species. Both values are controversial and subject to change. In the CTR, U.S. EPA reserved the mercury criteria for fresh water and aquatic life and may adopt new criteria at a later date.

Analytical data provided by the Discharger indicate that mercury was detected at a maximum effluent concentration of 0.5 µg/l. Using an average daily flow rate of

0.76 mgd reported in the Report of Waste Discharge and a maximum detected mercury concentration of 0.5 µg/l, the approximate mass of mercury discharged daily is 0.0032 lbs/day. The SIP, Section 1.3, requires the establishment of an effluent limitation when the detected concentration exceeds an applicable criterion or objective. The maximum detected concentration of mercury exceeds the human health CTR criterion. This Order contains an average monthly concentration-based Effluent Limitation of 0.05 µg/l for mercury based on the CTR criterion for waters from which both water and aquatic organisms are consumed. A monthly average Effluent Limitation of 0.012 µg/l for mercury is included in existing Waste Discharge Requirements, Order No. 98-236. In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(i)(B)(1), the adoption of less stringent effluent limitations for mercury is not considered backsliding since U.S. EPA promulgated the CTR. This Order also contains a mercury interim performance-based mass Effluent Limitation of 1.2 lbs/twelve months for the effluent discharge to Hutchinson Creek. This limitation is based on maintaining the mercury loading at the current level until a total maximum daily load (TMDL) can be established and EPA develops mercury standards that are protective of human health. The mass limitation is derived using the maximum observed effluent mercury concentration of 0.5 µg/l and a reported average daily flow rate of 0.76 mgd. If U.S. EPA develops new water quality standards for mercury, this Order may be reopened and the Effluent Limitation adjusted. A time schedule has been included in this Order for compliance with the mercury limitation.

h) **Aluminum**:

Analytical data provided by the Discharger indicate that aluminum was detected in each of the three effluent samples. Detected concentrations of aluminum in the effluent ranged from 19 µg/l to 71 µg/l. U.S. EPA established Ambient Water Quality criteria for the protection of freshwater aquatic life of 87 µg/l (four-day average) and 750 µg/l (one-hour average). Using the methodology in the U.S. EPA's Technical Support Document (TSD) for Water Quality-Based Toxics Control, the projected Maximum Effluent Concentration (MEC) of aluminum is calculated at 398 µg/l. Therefore, the discharge from the Beale AFB WWTP has a reasonable potential to cause an exceedance of the Basin Plan narrative toxicity objective. This Order includes concentration-based Effluent Limitations for aluminum based on the Basin Plan narrative toxicity objective utilizing the EPA's recommended Ambient Criteria.

i) **Methylene Blue Active Substances (MBAS):**

Analytical data provided by the Discharger indicate that MBAS was detected in 62 of 88 effluent samples. The maximum detected effluent concentration of MBAS was reported at 1,200 µg/l. Using the TSD reasonable potential analysis, the projected MEC for MBAS is calculated at 1,920 µg/l.

The current Secondary MCL for MBAS is 500 µg/l. The existing permit contains a monthly average Effluent Limitation based on the Secondary MCL of 500 µg/l and a daily maximum Effluent Limitation of 1,000 µg/l for MBAS. The maximum detected concentration of MBAS in the effluent exceeds the monthly average and the daily maximum Effluent Limitations contained in the existing permit. Therefore, MBAS has violated and presents a reasonable potential to cause or contribute to an exceedance of permit limitations. Monthly average and daily maximum concentration-based Effluent Limitations for MBAS as contained in the existing permit are continued in this Order.

j) **Ammonia**:

Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate, and denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification processes to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. U.S. EPA has developed Ambient Water Quality Criteria for the protection of freshwater aquatic life. The discharge from the Beale AFB WWTP has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan narrative toxicity objective, which requires that: "All waters be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal or aquatic life." Effluent Limitations for ammonia are included in this Order to assure the treatment process adequately nitrifies the waste stream to protect the beneficial uses of the receiving stream and to prevent aquatic toxicity.

k) **Iron**:

Analytical data provided by the Discharger indicate that iron was detected in each of the three effluent samples. The maximum detected effluent concentration of iron was reported at 69 µg/l. Using the TSD reasonable potential analysis, the projected MEC of iron in the effluent is calculated at 386 µg/l. The current Secondary MCL for iron is 300 µg/l.

The projected MEC of iron exceeds the Secondary MCL. Municipal and domestic water supply is designated as a beneficial use of the Bear River, which is downstream of Hutchinson Creek. Pursuant to the Basin Plan Tributary Rule, the municipal and

domestic water supply beneficial use is applied to Hutchinson Creek. To protect the municipal and domestic beneficial use, this Order includes a monthly average concentration-based Effluent Limitation for iron based on the Basin Plan chemical constituents objective and the Secondary MCL of 300 µg/l.

l) **Oil and Grease and Total Petroleum Hydrocarbons**:

Analytical data provided by the Discharger indicate that total petroleum hydrocarbons as diesel (TPHD), total petroleum hydrocarbons as motor oil (TPHO), and n-hexane extractable material (total oil and grease) were detected in the effluent at maximum concentrations of 560 µg/l, 1,500 µg/l, and 11,000 µg/l, respectively.

U.S. EPA recommended a Drinking Water Health suggested no-adverse-response level (SNARL) of 100 µg/l for an exposure of 10 days or less for TPHD and 5.0 µg/l for total petroleum hydrocarbons as gasoline (TPHG). The taste and odor threshold for TPHG is 5.0 µg/l. The Basin Plan includes a water quality objective for oil and grease and floating material in surface waters, which state: "Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses" and that: "Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses". The antidegradation provisions of the State Water Resources Control Board, Resolution No. 68-16 states that: " Any activities which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained". The existing permit includes monthly average and daily maximum Effluent Limitations of 100 µg/l and 200 µg/l, respectively, for TPHD and monthly average, weekly average, and daily maximum Effluent Limitations of 10 mg/l, 15 mg/l, and 20 mg/l, respectively, for oil and grease. Detected concentrations of TPHD, TPHO, and total oil and grease in the effluent indicate that the discharge has a reasonable potential to violate Basin Plan narrative objectives for oil and grease and floating material and SWRCB Resolution No. 68-16 (antidegradation policy). Concentration and mass discharges of total oil and grease can be controlled through an implementation of an effective pretreatment program. Municipal and domestic water supply is designated as a beneficial use of the Bear River, which is downstream from Hutchinson Creek. Pursuant to the Basin Plan Tributary Rule, the municipal and domestic water supply beneficial use is applied to Hutchinson Creek. Therefore, to protect the municipal and domestic water supply beneficial use, this Order includes a monthly average Effluent Limitation for total petroleum hydrocarbons based on the Basin Plan chemical constituents objective and antidegradation policy (SWRCB Resolution No. 68-16) utilizing the taste and odor threshold of 5.0 µg/l. This Order

also contains monthly average and daily maximum Effluent Limitations of 10 mg/l and 15 mg/l, respectively, for oil and grease based on the antidegradation policy (SWRCB Resolution No. 68-16).

m) **Total Chlorine Residual:**

Chlorine is commonly used as a disinfection agent in the treatment of the wastewater. Proper disinfection ensures destruction of pathogens prior to discharge to the surface waters. Beale AFB uses chlorine for disinfection of wastewater at the treatment plant. Because chlorine poses a threat to human health and is especially harmful to organisms living in water, a dechlorination process is necessary for the removal of chlorine. For dechlorination, the Discharger uses sulfur dioxide, which combines with chlorine, to render it relatively unreactive and thus removes it from the waste stream. Inadequate dechlorination may result in the discharge of chlorine to the receiving stream and cause toxicity to aquatic life. The Basin Plan narrative toxicity objective requires that "all waters be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal or aquatic life."

U.S. EPA has developed Ambient Water Quality Criteria for the protection of freshwater aquatic life. The recommended maximum one-hour average and four-day average concentrations for chlorine are 0.02 mg/l and 0.01 mg/l, respectively. Analytical data provided by the Discharger indicate that chlorine was detected in the effluent at a maximum concentration of 0.57 mg/l, which is 57 times greater than the Ambient Water Quality criterion for four-day average condition. Effluent Limitations for chlorine are included in this Order and are based on the Basin Plan narrative toxicity objective utilizing the Ambient Criteria.

n) **Nitrate (as N):**

Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate, and denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification process to remove ammonia from the waste stream. Inadequate or incomplete nitrification or denitrification may result in the discharge of ammonia or nitrate to the receiving stream. Recent toxicity studies have indicated that a possibility that nitrate is toxic to aquatic organisms.

Analytical data provided by the Discharger indicate that nitrate (as N) was detected in each of 13 effluent samples. The maximum detected effluent concentration of nitrate (as N) was reported at 68,000 µg/l. Using the TSD reasonable potential analysis, the

projected MEC of nitrate is calculated at 242,760 µg/l. The Basin Plan on page III-3.0, states: "Water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses" and U.S. EPA has developed a Primary MCL of 10,000 µg/l for nitrate (as N).

The maximum detected concentration of nitrate exceeds the Primary MCL. It indicates that the discharge from the Beale AFB WWTP has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan chemical constituents objective. Effluent Limitations for nitrate are included in this Order and are based on the Basin Plan narrative objective and the Primary MCL.

o) **Nitrite (as N):**

Analytical data provided by the Discharger indicate that nitrite was detected in 3 of 4 effluent samples. The maximum detected effluent concentration of nitrite (as N) was reported at 330 µg/l. Using the TSD reasonable potential analysis, the projected MEC of nitrite is calculated at 1,551 µg/l.

U.S. EPA has developed a Primary MCL of 1,000 µg/l for nitrite (as N). The projected MEC exceeded the Basin Plan chemical constituents objective. Municipal and domestic water supply is designated as a beneficial use of the Bear River, which is downstream of Hutchinson Creek. Pursuant to the Basin Plan Tributary Rule, the municipal and domestic beneficial use is applied to Hutchinson Creek. Therefore, to protect the municipal and domestic beneficial use, this Order includes an Effluent Limitation for nitrite.

16. As stated in the above Findings, the U.S. EPA adopted the NTR and the CTR, which contain promulgated water quality criteria applicable to this discharge and the State Water Resources Control Board adopted the SIP, which contains guidance on implementation of the NTR and CTR. CTR and NTR criteria along with beneficial use designations contained the Basin Plan and antidegradation policies constitute water quality standards pursuant to the Clean Water Act. The SIP, Section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Board shall establish interim requirements and dates for their achievement in the NPDES permit. The interim limitations must: be based on current treatment plant performance or existing permit limitations, whichever is more stringent; include interim compliance dates separated by no more than one year, and; be included in the Provisions. The interim limitations in this Order are based on the current treatment plant performance. In developing the interim limitation, where there are ten or more sampling data points available, sampling and laboratory variability are accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean (*Basic Statistical Methods for Engineers and Scientists*, Kennedy and Neville). Therefore, the interim limitations in this Order are established as the mean plus 3.3 standard deviations of the available data. Where actual sampling shows an exceedance of the proposed 3.3 standard deviations interim limit, the

maximum detected concentration has been established as the interim limitation. When there are less than ten sampling data points available, the *Technical Support Document for Water Quality Based Toxics Control* (EPA/505/2-90-001) (TSD) recommends a coefficient of variation of 0.6 be utilized as representative of wastewater effluent sampling. The TSD recognizes that a minimum of ten data points is necessary to conduct a valid statistical analysis. Therefore, when there are less than ten sampling results for a constituent, the interim limitation is based on the corresponding multiplier from Table 3.1 of the TSD multiplied by the maximum observed sampling point. Interim limitations are established when compliance with NTR- and CTR-based Effluent Limitations cannot be achieved by the existing discharge. Discharge of constituents in concentrations in excess of the final Effluent Limitations, but in compliance with the interim Effluent Limitations, can significantly degrade water quality and adversely affect the beneficial uses of the receiving stream on a long-term basis. The interim limitations, however, establish an enforceable ceiling concentration until compliance with the Effluent Limitation can be achieved.

17. Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit*." Section 2.1, further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: …*"(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable."* This Order requires the Discharger to provide this information. The new water quality based effluent limitations for bis(2-ethylhexyl)phthalate, cadmium, copper, cyanide, bromodichloromethane, dibromochloromethane, and mercury become effective on **1 July 2004** if a compliance schedule justification is not completed and submitted by the Discharger to the Regional Board. Otherwise, final water quality based effluent limitations for bis(2-ethylhexyl)phthalate, cadmium, copper, cyanide, bromodichloromethane, dibromochloromethane, and mercury become effective on **1 April 2009**.

18. The beneficial uses of the underlying ground water are municipal and domestic, industrial service, industrial process and agricultural supply.

19. The Basin Plan states, on page II-1.00, "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning" and "…disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses." The existing and potential beneficial uses that currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1 of the Basin Plan. The designated beneficial uses of the Bear River, downstream of the discharge from the WWTP, include water contact recreation and agricultural irrigation. The Basin Plan

definition for water contact recreation includes "uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably potential. These uses include, but not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing or use of natural hot springs". To protect these beneficial uses, the Regional Board finds that the wastewater must be disinfected and adequately treated to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. Filtration also reduces solids in the effluent and allows for more effective disinfection. The wastewater must be treated to tertiary standards (filtered) to protect contact recreational and food crop irrigation uses.

The California Department of Health Services (DHS) has developed reclamation criteria, California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 ml as a 7-day median. Title 22 is not directly applicable to surface waters; however, the Regional Board finds that it is appropriate to apply DHS's reclamation criteria because Hutchinson Creek is used for irrigation of agricultural land. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS.

In addition to coliform testing, a turbidity effluent limitation has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is also capable of reliably meeting a turbidity limitation of two nephelometric turbidity units (NTU) as a daily average. Failure of the filtration system such that virus removal is impaired would normally result in increased particles in the effluent, which result in higher effluent turbidity. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours, to days, to identify high coliform concentrations.

The application of tertiary treatment processes results in the ability to achieve lower levels for BOD and TSS than the secondary standards currently prescribed; the 30-day average BOD and TSS limitations have been revised to 10 mg/l, which is technically based on the capability of a tertiary system.

The establishment of tertiary limitations has not been previously required for this discharge; therefore, a schedule for compliance with the tertiary treatment requirement is included as a Provision in this Order.

20. This Order contains Effluent Limitations and requires a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water. In accordance with California Water Code, Section 13241, the Regional Board has considered the following:

As stated in the above Findings, the past, present, and probable future beneficial uses of the receiving stream include domestic and municipal supply, agricultural irrigation, agricultural stock watering, industry power supply, water contact recreation including canoeing and rafting recreation, non-contact water recreation including aesthetic enjoyment, warm freshwater habitat, cold freshwater habitat, potential warm fish migration habitat, potential cold fish migration habitat, potential warm spawning habitat, potential cold spawning habitat, and wildlife habitat.

The environmental characteristics of the hydrographic unit including the quality of water available will be improved by the requirement to provide tertiary treatment for this wastewater discharge. Tertiary treatment will allow for the continued reuse of the undiluted wastewater for food crop irrigation and contact recreation activities which is otherwise unsafe according to recommendations from the DHS. Fishable, swimable, and agricultural irrigation water quality conditions can be reasonably achieved through the coordinated control of all factors, which affect water quality in the area.

The economic impact of requiring an increased level of treatment has been considered. State Board staff has estimated that the increased level of treatment will cost approximately $5.1 million. The loss of beneficial uses within downstream waters, without the tertiary treatment requirement, include prohibiting the irrigation of food crops and prohibiting public access for contact recreational purposes, would have a detrimental economic impact. In addition to pathogen removal to protect irrigation and recreation, tertiary treatment may also aid in meeting discharge limitations for other pollutants, such as heavy metals, reducing the need for advanced treatment.

The need to develop housing at the Base will be facilitated by improved water quality, which protects the contact recreation and irrigation uses of the receiving water. DHS recommends that, in order to protect the public health, undiluted wastewater effluent must be treated to a tertiary level, for contact recreational and food crop irrigation uses. Without tertiary treatment, the downstream waters could not be safely utilized for contact recreation or the irrigation of food crops.

It is the Regional Board's policy, (Basin Plan, page IV-15.00, Policy 2) to encourage the reuse of wastewater. The Regional Board requires Dischargers to evaluate how reuse or land disposal of wastewater can be optimized. The need to develop and use recycled water is facilitated by providing a tertiary level of wastewater treatment, which will allow for a greater variety of uses in accordance with California Code of Regulations, Title 22.

21. The beneficial uses of the underlying ground water are municipal and domestic, industrial service, industrial process and agricultural supply.

22. Basin Plan water quality objectives to protect the beneficial uses of groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity of groundwater, and taste and odor. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, or animals. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the maximum contaminant levels (MCLs) in Title 22, CCR. The Basin Plan requires the application of the most stringent objective necessary as necessary to ensure that groundwaters do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

23. State Water Resources Control Board (SWRCB) Resolution No. 68-16 (hereafter Resolution 68-16) requires the Regional Board in regulating discharge of waste to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board's policies (e.g., quality that exceeds water quality objectives). Resolution 68-16 requires that the discharge be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

24. Domestic wastewater contains constituents such as total dissolved solids (TDS), specific conductivity, pathogens, nitrates, organics, metals and oxygen demanding substances (BOD). The discharge to land, with disposal by percolation, may result in an increase in the concentration of these constituents in groundwater. The increase in the concentration of these constituents in groundwater must be consistent with Resolution 68-16. Any increase in pollutant concentrations in groundwater must be shown to be necessary to allow wastewater utility service necessary to accommodate housing and economic expansion in the area and must be consistent with maximum benefit to the people of the State of California. Some degradation of groundwater by the Discharger is consistent with Resolution 68-16 provided that:

    a. the degradation is limited in extent;

b. the degradation after effective source control, treatment, and control is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order;

c. the Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures; and

d. the degradation does not result in water quality less than that prescribed in the Basin Plan.

25. Monitoring of the groundwater must be conducted to determine if the discharge has caused an increase in constituent concentrations, when compared to background. The monitoring must, at a minimum, require a complete assessment of groundwater impacts including the vertical and lateral extent of degradation, an assessment of all wastewater-related constituents which may have migrated to groundwater, an analysis of whether additional or different methods of treatment or control of the discharge are necessary to provide best practicable treatment or control to comply with Resolution No. 68-16. Economic analysis is only one of many factors considered in determining best practicable treatment. If monitoring indicates that the discharge has incrementally increased constituent concentrations in groundwater above background, this permit may be reopened and modified.

26. The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, California Code of Regulations (CCR), section 20005 et seq. (hereafter Title 27). The exemption, pursuant to Title 27 CCR section 20090(a), is based on the following:

a. The waste consists primarily of domestic sewage and treated effluent;

b. The waste discharge requirements are consistent with water quality objectives; and

c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.

27. This Order requires the Discharger to begin groundwater monitoring and includes a regular schedule of groundwater monitoring in the attached Monitoring and Reporting Program. The groundwater monitoring reports are necessary to evaluate impacts to waters of the state to assure protection of beneficial uses and compliance with Regional Board plans and policies, including Resolution 68-16. Evidence in the record includes effluent monitoring data that indicates the presence of constituents that may degrade groundwater and surface water.

28. The Basin Plan states that "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances*." The Basin Plan requires that "*as*

a minimum, compliance with this objective…shall be evaluated with a 96-hour bioassay." Order No. R5-2004-0045 requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective. The Basin Plan also states: "…*effluent limits based upon acute biotoxicity tests of effluents will be prescribed*…" Effluent limitations for acute toxicity are included in the Order.

PRETREATMENT

29. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

30. The Discharger accepts wastes from industries located throughout the Base. The Federal Clean Water Act, Section 307(b), and Federal Regulations, 40 CFR Part 403, require publicly owned treatment works to develop an acceptable industrial pretreatment program. A pretreatment program is required to prevent the introduction of pollutants which will interfere with treatment plant operations or sludge disposal and prevent pass through of pollutants that exceed water quality objectives, standards or permit limitations.

    The Discharger owns and operates a military base. It is not realistic that the Discharger could develop a Sewer Use Ordinance to comply with the Federal Pretreatment regulations. The Discharger has a greater ability to control the discharge of wastes into the sanitary sewer system than most municipalities. The Discharger must develop technically based local limits. The Discharger shall also develop procedures, equivalent to a Sewer Use Ordinance, to assure that industrial discharges into the collection system meet the intent of the Federal Pretreatment Regulations. These local limits and procedures shall be incorporated into an acceptable industrial pretreatment program, which shall be submitted for approval by the Regional Board within **one-year** of adoption of this Order.

WATER RECYCLING

31. The California Department of Health Services (DHS) has established statewide reclamation criteria in Chapter 3, Division 4, Title 22, California Code of Regulations (CCR), Section 60304, et seq. (Hereafter Title 22) for the use of recycled water. The DHS has also established Guidelines for Use of Reclaimed Water. These requirements implement the reclamation criteria in Title 22.

32. Uses of recycled water other than those identified in Title 22 are not regulated or allowed by this Order.

33. Recycled water is a waste and, as such, any discharge to surface water must be regulated under the National Discharge Elimination System (NPDES). The discharge of wastes may not cause degradation of groundwater in accordance with the State Board's antidegradation

policy. Recycled Water Prohibitions have been included in this Order to assure that: recycled water is not discharged to surface waters; the by-pass or overflow of untreated or partially treated recycling water is prohibited; excessive irrigation does not result in excessive runoff; overspray or runoff is minimized; and, recycled water is not used or stored within 50 feet of any well used for domestic water supply. Groundwater Limitations have been included in this Order to assure that the use of recycled water does not degrade groundwater quality.

34. State Board Resolution No. 77-1, *Policy with Respect to Water Reclamation in California*, encourages recycling projects that replace or supplement the use of fresh water, and *The Water Recycling Law* (CWC sections 13500-13529.4) declares that utilization of recycled water is of primary interest to people of the State in meeting future water needs.

35. In 1996, the State Board and the DHS set forth principles, procedures, and agreements to which the agencies committed themselves, relative to the use of reclaimed water in California, in a document titled *Memorandum of Agreement Between the Department of Health Services and The State Water Resources Control Board On The Use of Reclaimed Water* (MOA). This Order is consistent with the MOA.

36. A 1988 Memorandum of Understanding between the California Department of Health Services (DHS) and the State Board on the use of recycled water establishes basic principles relative to the two agencies and the regional boards. The Memorandum allocates primary areas of responsibility and authority between the agencies and provides for methods and mechanisms necessary to assure ongoing, continuous future coordination of activities relative to use of recycled water.

37. Water Recycling Limitations have been included in this Order to assure compliance with requirements contained in Title 22 and the DHS - State Board MOA.

38. This use of recycled water is exempt from the requirements of Title 23, CCR, section 2510, et seq. (hereafter Chapter 15) and Title 27, CCR, pursuant to Section 2511(b) based on the following:

    a. The Board is issuing a Reclamation permit, and

    b. The reclamation complies with the Basin Plan, and

    c. The reclaimed water does not need to be managed according to 22 CCR, Division 4.5, Chapter 11, as a hazardous waste.

GENERAL

39. The Discharger's sanitary sewer system collects wastewater using sewers, pipes, pumps, and/or other conveyance systems and directs the raw sewage to the wastewater treatment plant. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the wastewater treatment plant. Sanitary sewer overflows are prohibited by this Order. All violations must be reported as required in Standard Provisions. Conveyance facilities (such as wet wells, regulated impoundments, tanks, highlines, etc.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage/conveyance facilities.

    Sanitary sewer overflows consist of varying mixtures of domestic sewage, industrial wastewater, and commercial wastewater. This mixture depends on the pattern of land use in the sewage collection system tributary to the overflow. The chief causes of sanitary sewer overflows include lack of maintenance, blockages due to grease, roots, and debris, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, storm water or groundwater inflow/infiltration, insufficient capacity, and contractor caused blockages.

    Sanitary sewer overflows often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen demanding organic compounds, oil and grease, and other pollutants. Sanitary sewer overflows can cause exceedance of applicable water quality objectives, pose a threat to public health, adversely affect aquatic life, and impair the public recreational use and aesthetic enjoyment of surface waters in the area.

    The Discharger is responsible for all necessary steps to adequately maintain and operate its sanitary sewer collection system.

40. Section 13267 of the California Water Code states, in part, "*(a) A regional board, in establishing…waste discharge requirements… may investigate the quality of any waters of the state within its region"* and *"(b) (1) In conducting an investigation…, the regional board may require that any person who… discharges… waste…that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires.*" The attached Monitoring and Reporting Program is issued pursuant to California Water Code Section 13267. The monitoring and reporting program to monitor groundwater required by this Order and the attached Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges waste subject to this Order.

41. The discharge to Hutchinson Creek and the Golf Course are presently governed by Waste Discharge Requirements, Order No. 98-236.

42. The Regional Board has considered the information in the attached Information Sheet in Attachments A, B, C, D, and E and the Information Sheet are part of this Order.

43. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, *et seq*.), requiring preparation of an environmental impact report or negative declaration in accordance with Section 13389 of the California Water Code.

44. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

45. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

46. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.

47. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect 50 days following permit adoption, provided EPA has no objections.

IT IS HEREBY ORDERED that Order No. 98-236 is rescinded and the United States Air Force, Beale AFB, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

1. Discharge of wastewater at a location or in a manner different from that described in Findings is prohibited.

2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13. [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)"].

3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

B. Water Recycling Prohibitions:

1. The discharge of reclaimed water to surface waters is prohibited.

2. By-pass or overflow of untreated or partially treated reclamation water from the wastewater treatment plant, any intermediate unit processes, or the reclamation distribution system to the point of use is prohibited.

3. Excessive irrigation with reclaimed water which results in excessive runoff of reclaimed water, or continued irrigation of reclaimed water during periods of rain is prohibited. Overspray or runoff associated with normal sprinkler use shall be minimized.

4. Application or impoundment of reclaimed water within 50 feet of any well used for domestic water supply is prohibited, unless approved by the Department of Health Services Drinking Water Branch.
5. The use of reclaimed water shall not cause the degradation of groundwater.

6. Discharge of waste classified as hazardous, as defined in Sections 2521(a) of Title 23, CCR, Section 2510, et seq., (hereafter Chapter 15), or 'designated', as defined in Section 13173 of the California Water Code, is prohibited.

C. Effluent Limitations - Discharge to Hutchinson Creek from the Disposal Pond (Outfall No. 001):

1. Effluent from the wastewater treatment plant shall not exceed the following limits (from adoption until **1 April 2009**):

Constituents	Units	Monthly Average	Weekly Average	Monthly Median	Daily Maximum	Daily Average
BOD[1]	mg/l	30[2]	45[2]	--	--	60[2]
	lbs/day[3]	1,252	1,878	--	--	2,504
Total Suspended Solids (TSS)	mg/l	30[2]	45[2]	--	--	60[2]
	lbs/day[3]	1,252	1,878	--	--	2,504
Total Coliform Organisms	MPN/100ml	--	--	23	230	--
Settleable Solids	ml/l	0.1	--	--	0.2	--
Methylene Blue Active Substances (MBAS)	µg/l	500	--	--	1,000	--
	lbs/day[3]	20.9	--	--	41.7	--
Iron (Total Recoverable)	µg/l	300	--	--	--	--
	lbs/day[3]	12.5	--	--	--	--
Constituents	Units	Monthly Average	Weekly Average	Monthly Median	Daily Maximum	Daily Average
Oil and Grease	mg/l	10	--	--	15	--

	lbs/day[3]	417.3	--	--	625.9	--
Total Petroleum Hydrocarbons	µg/l	5.0	--	--	--	--
	lbs/day[3]	0.209	--	--	--	--

[1] 5-day, 20°C biochemical oxygen demand (BOD)
[2] To be ascertained by a 24-hour composite
[3] Based upon a design treatment capacity of 5.0 mgd

Constituents	Units	Monthly Average	Four-day Average	One-hour Average	Daily Maximum	Daily Average
Aluminum[3] (Total Recoverable)	µg/l	71	--	--	--	143
	lbs/day[1]	3.0	--	--	--	6.0
Nitrate (as N)	µg/l	10,000	--	--	--	--
	lbs/day[1]	417	--	--	--	--
Nitrite (as N)	µg/l	1,000	--	--	--	--
	lbs/day[1]	41.7	--	--	--	--
Ammonia	mg/l	Attachment B	--	Attachment C	--	--
	lbs/day[2]	Calculate	--	Calculate	--	--
Total Chlorine Residual	mg/l	--	0.01	0.02	--	--
	lbs/day[1]	--	0.42	0.83	--	--

[1] Based on a design treatment capacity of 5.0 mgd.
[2] The mass limit shall be calculated based on the concentration limitations (from Attachments) and the design flow of 5.0 mgd.
[3] Compliance can be demonstrated using either total, or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods.

2. Effluent shall not exceed the following interim priority pollutant limits (from adoption until **1 April 2009**):

Constituents	Unit	Daily Average	Daily Maximum
Bis(2-ethylhexyl)phthalate[1,4]	µg/l	--	53
	lbs/day[2]	--	2.2
Cadmium[1] (Total Recoverable)	µg/l	5.0	--
	lbs/day[2]	0.21	--

Constituents	Unit	Daily Average	Daily Maximum
Copper[1] (Total Recoverable)	µg/l	40	--
	lbs/day[2]	1.7	--
Cyanide[1]	µg/l	37	--

(Total Recoverable)	lbs/day[2]	1.5	--
Dibromochloromethane[1,4]	µg/l	--	1.1
	lbs/day[2]	--	0.046
Bromodichloromethane[1,4]	µg/l	--	4.1
	lbs/day[2]	--	0.17
Mercury[1]	µg/l	0.5	--
(Total Recoverable)	lbs/12 months[3]	1.2	--

[1] See Provision No. 6 of this Order for the effective compliance date for bis(2-ethylhexyl)phthalate, cadmium, copper, cyanide, dibromochloromethane, bromodichloromethane, and mercury.

[2] Based upon a design treatment capacity of 5.0 mgd.

[3] The mass-based Effluent Limitation for mercury is 1.2 lbs/12 months calculated using the maximum detected effluent concentration of 0.5 µg/l and the average daily flow of 0.76 mgd.

[4] Grab sampling will be conducted for bis(2-ethylhexyl)phthalate, dibromochloromethane, and bromodichloromethane to determine compliance with permit limitations.

3. Effluent from the wastewater treatment plant shall not exceed the following limits (from **1 April 2009** forward):

Constituents	Units	Monthly Average	Weekly Average	7-day Median	Daily Average	Daily Maximum	Instantaneous Maximum
BOD[1]	mg/l	10[2]	15[2]	--	20[2]	--	--
	lbs/day[3]	417	626	--	835	--	--
Total Suspended Solids	mg/l	10[2]	15[2]	--	20[2]	--	--
	lbs/day[3]	417	626	--	835	--	--
Total Coliform	MPN/100ml	--	--	2.2	--	--	23
Turbidity	NTU	--	--	--	2.0	5.0[4]	--
Mercury	µg/l	0.05	--	--	0.1	--	--
(Total Recoverable)	lbs/day[3]	0.0021	--	--	0.0042	--	--
Bis(2-ethylhexyl)phthalate	µg/l	1.8	--	--	--	5.4	--
	lbs/day[3]	0.075	--	--	--	0.23	--
Cadmium (Total Recoverable)	µg/l	Attachment D	--	--	Attachment D		--
	lbs/day[5]	Calculate	--	--	Calculate		--
Copper (Total Recoverable)	µg/l	Attachment E	--	--	Attachment E		--
	lbs/day[5]	Calculate	--	--	Calculate		--
Cyanide (Total Recoverable)	µg/l	3.5	--	--	9.6		--
	lbs/day[3]	0.15	--	--	0.4		--
Bromodichloromethane	µg/l	0.56	--	--	--	1.6	--
	lbs/day[3]	0.023	--	--	--	0.067	--

Dibromochloromethane	µg/l	0.41	--	--	--	0.8	--
	lbs/day[3]	0.017	--	--	--	0.033	--
Methylene Blue Active	µg/l	500	--	--	--	1,000	--
Substances (MBAS)	lbs/day[3]	20.9	--	--	--	41.7	--
Iron	µg/l	300	--	--	--	--	--
(Total Recoverable)	lbs/day[3]	12.5	--	--	--	--	--
Oil and Grease	mg/l	10	--	--	--	15	--
	lbs/day[3]	417.3	--	--	--	625.9	--
Total Petroleum	µg/l	5.0	--	--	--	--	--
Hydrocarbons	lbs/day[3]	0.209	--	--	--	--	--

[1] 5-day, 20°C biochemical oxygen demand (BOD)
[2] To be ascertained by a 24-hour composite
[3] Based upon a design treatment capacity of 5.0 mgd
[4] The turbidity shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period. At no time shall the turbidity exceed 10 NTU.
[5] The mass limit shall be calculated based on the concentration limitations (from Attachments) and the design flow of 5.0 mgd.

Constituents	Units	Monthly Average	Four-day Average	Six-month Average	One-hour Average	Daily Maximum	Daily Average
Aluminum[3]	µg/l	71	--	--	--	--	143
(Total Recoverable)	lbs/day[1]	3.0	--	--	--	--	6.0
Nitrate (as N)	µg/l	--	--	10,000	--	--	--
	lbs/day[1]	--	--	417	--	--	--
Nitrite (as N)	µg/l	--	--	1,000	--	--	--
	lbs/day[1]	--	--	41.7	--	--	--
Ammonia	mg/l	Attachment B	--	--	Attachment C	--	--
	lbs/day[2]	Calculate	--	--	Calculate	--	--
Total Chlorine Residual	mg/l	--	0.01	--	0.02	--	--
	lbs/day[1]	--	0.42	--	0.83	--	--

[1] Based upon a design treatment capacity of 5.0 mgd.
[2] The mass limit shall be calculated based on the concentration limitations (from Attachments) and the design flow of 5.0 mgd.
[3] Compliance can be demonstrated using either total, or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods.

4. The effluent mass mercury loading to Hutchinson Creek shall not exceed 1.2 pounds as a twelve-month average.

   a. In calculating for compliance, the Discharger shall count all non-detect results at one half of the method detection limit and shall apply the monthly average flow from the discharge. If compliance with the effluent limit is not attained due to the

non-detect contribution, the Discharger shall improve and implement available analytical capabilities and compliance will be evaluated with consideration of the detection limits.

b. Twelve month mass loadings shall be calculated for each calendar month. For monthly measures, calculate monthly loadings using average monthly flow and the average of all mercury analyses conducted that month. The Discharger shall submit a cumulative total of mass loadings for the previous twelve months with each self-monitoring report. Compliance will be determined based on monitoring results from the previous twelve calendar months.

5. Wastewater shall be oxidized, coagulated and filtered, or equivalent treatment provided by **1 April 2009.**

6. The arithmetic mean of 20°C BOD (5-day) and total suspended solids in effluent samples collected over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).

7. The discharge shall not have a pH less than 6.5 nor greater than 8.5.

8. The average daily dry weather effluent flow shall not exceed 5.0 mgd.

9. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay - - - - - - - - - 70%
Median for any three or more consecutive bioassays - - - - 90%

D. Water Recycling Limitations:

1. The median concentration of total coliform bacteria in the disinfected effluent discharged to the golf course irrigation system shall not exceed a most probable number (MPN) of 23 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed.

2. The use of reclaimed water shall not cause a statistically significant increase of nitrate or salt concentrations in underlying ground water.

3. The use of reclaimed water shall not cause concentrations of chemicals and radionuclides in ground water to exceed limits set forth in Title 22, Chapter 15, Articles 4 and 5, of the California Code of Regulations.

E. Water Recycling Specifications:

1. Recycled wastewater used for irrigation shall meet the criteria contained in Title 22, CCR.

2. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations.

3. Neither the treatment nor the discharge shall cause a nuisance or condition of pollution as defined by the California Water Code, Section 13050.

4. The Discharger shall operate all systems and equipment to maximize treatment of wastewater and optimize the quality of the discharge.

5. The freeboard in the effluent storage pond and the Golf Course Pond shall never be less than two feet as measured from the water surface to the lowest point of overflow.

6. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment plant site boundaries.

7. As a means of discerning compliance with Water Recycling Specification No. 6, the dissolved oxygen content in the upper zone (one foot) of the effluent storage pond and the Golf Course Pond shall not be less than 1.0 mg/l.

8. The wastewater in the effluent storage pond and the Golf Course Pond shall not have a pH of less than 6.5 or greater than 8.5.

9. The effluent storage pond and the Golf Course Pond shall be managed to prevent the breeding of mosquitoes. In particular,

    a. An erosion control program should assure that small coves and irregularities are not created around the perimeter of the waste surface.
    b. Weeds shall be minimized through control of water depth, harvesting, and/or herbicides.
    c. Dead algae, vegetation, and debris shall not accumulate on the water surface.

10. Public contact with recycled wastewater at the golf course shall be controlled through the use of fences and cautionary sings, and/or approriate means. Perimeter warning signs indicating that recycled water is in use shall be posted at adequate signage along the property boundary and at each access road entrance to the irrigation area, including cart paths. The size and contents of these signs shall be as described in Section 60310(a) of Title 22.

11. Recycled water controller, valves, and similary appurtenances shall be affixed with recycled water warning signs, and shall be equipped with removable handles, locking mechanisms, or some other means to prevent public access or tampering. The contents

of the signs shall conform to Section 60310 of Title 22. Quick couplers and sprinkler heads, if used, shall be of a type, or secured in a manner, that permits operation only by authorized personnel. Hose bibs that the public could use shall be eliminated.

12. Any connection between the recycled water conveyance system and any potable water conveyance system, groundwater supply well, or surface water supply source for the purpose of supplementing recycled water shall be equipped with a DHS-approved backflow prevention device.

13. Direct or windblown spray of recycled water shall be confined to the designated land application area and shall be prevented from entering outdoor eating areas, dwellings, drinking water facilities, food handling facilities, and other locations where the public may be present. In addition, direct or windblown spray of recycled water shall not enter surface watercourses.

14. Application of wastewater to land shall not be performed within 24 hours before a forecasted storm, during precipitation, or within 24 hours after any precipitation event, nor when the ground is saturated.

15. Spray irrigation with recycled water is prohibited when wind velocities exceed 30 mph.

16. Areas irrigated with recycled water shall be managed to prevent breeding of mosquitoes. More specifically:

    a. All applied irrigation water must infiltrate completely within 24 hours.

    b. Ditches not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation.

    c. Low-pressure and un-presserized pipelines and ditches which are accessible to mosquitoes shall not be used to store reclaimed water.

17. Recycled irrigation water shall be managed, using BPTC methods, to minimize runoff and movement of aerosols from the designated golf course irrigation areas.

18. A 15 foot buffer zone shall be maintained between any watercourse and the wetted area produced during land application of effluent.

19. A 50 foot buffer zone shall be maintained between any spring, domestic well or irrigation well and the wetted area produced during land application of effluent.

20. Application rates of recycled water shall not exceed agronomic rates considering the crop, soil, climate, and irrigation management system. The nutrient loading of the reclamation areas, including nutritive value or organic and chemical fertilizers and of the reclaimed water shall not exceed the crop demand.

F. Industrial Waste Requirements

1. The discharge of fuels, lubricants, solvents, heavy metals, or other toxic materials into the sanitary sewer system in concentrations which adversely impact wastewater treatment plant operations or degrade treatment plant effluent quality is prohibited.

2. The Discharger shall submit annually, by **31 January**, a report summarizing the Discharger's industrial waste control activities conducted during the previous 12 months. The report shall include at a minimum:

   a. A summary of operation and maintenance performed on oil/water separators;

   b. Efforts to locate and regulate additional discharges of toxic materials to the sewage collection system; and

   c. Activities to educate and train Base personnel in proper handling and disposal of toxic materials; and description of incidents involving toxic materials spills entering the collection system, their impacts on the treatment system, efforts to locate the source, and any corrective action taken.

G. Sludge Disposal:

1. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.

2. Any proposed change in sludge use or disposal practice from a previously approved practice shall be reported to the Executive Officer and EPA Regional Administrator at least **90 days** in advance of the change.

3. Use and disposal of sewage sludge shall comply with existing Federal and State laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.

4. If the State Water Resources Control Board and the Regional Water Quality Control Boards are given the authority to implement regulations contained in 40 CFR 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR 503 whether or not they have been incorporated into this Order.

5. The Discharger is encouraged to comply with the "Manual of Good Practice for Agricultural Land Application of Biosolids" developed by the California Water Environment Association.

H. Receiving Water Limitations:

Receiving Water Limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit.

The discharge shall not cause the following in the receiving water:

1. Concentrations of dissolved oxygen to fall below 7.0 mg/l. The monthly median of the mean daily dissolved oxygen concentration shall not fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not fall below 75 percent of saturation.

2. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.

3. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.

4. Esthetically undesirable discoloration.

5. Fungi, slimes, or other objectionable growths.

6. The turbidity to increase as follows:

    a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.
    b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.
    c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.
    d. More than 10 percent where natural turbidity is greater than 100 NTUs.

7. The ambient pH to fall below 6.5, exceed 8.5, or the 30-day average to change by more than 0.5 units.

8. The ambient temperature to increase more than 5°F.

9. Deposition of material that causes nuisance or adversely affects beneficial uses.

10. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

11. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.

12. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.

13. Violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the State Water Resources Control Board pursuant to the CWA and regulations adopted thereunder.

14. Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.

15. The fecal coliform concentration in any 30-day period to exceed a geometric mean of 200 MPN/100 ml or cause more than 10 percent of total samples to exceed 400 MPN/100 ml.

I. Groundwater Limitations:

Release of waste constituents from any storage, treatment, or disposal component associated with the WWTP shall not, in combination with other sources of waste constituents, cause the following in groundwater:

1. Beneficial uses to be adversely impacted or water quality objectives to be exceeded.

2. Any constituent concentration, when compared with background, to be incrementally increased beyond the current concentration.

J. Provisions:

1. The treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

2. The Discharger shall not allow pollutant-free wastewater to be discharged into the collection, treatment, and disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

3. The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Water Resources Control Board, this Order may be reopened and a limitation based on that objective included.

4. There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality objectives. The constituents are specifically listed in a technical report requirement issued by the Executive Officer on 10 September 2001 and include NTR, CTR, and additional constituents that could exceed Basin Plan numeric or narrative water quality objectives. The Discharger shall comply with the following time schedule in conducting a study of the potential effect(s) of these constituents in surface waters:

Task	Compliance Date
Submit Study Report for Dioxins	**30 May 2004**

This Order is intended to be consistent with the requirements of the 10 September 2001 technical report. The technical report requirements shall take precedence in resolving any conflicts. The Discharger shall submit to the Regional Board on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

On or before each compliance date, the Discharger shall submit to the Regional Board the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule. If, after review of the study results, it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order may be reopened and effluent limitations added for the subject constituents.

5. This Order contains Effluent Limitations based on water quality criteria contained in the CTR for bis (2-ethylhexyl) phthalate, cadmium, copper, cyanide, bromodichloromethane, dibromochloromethane, and mercury. By **1 July 2004** the Discharger shall complete and submit a compliance schedule justification for bis (2-ethylhexyl) phthalate, cadmium, copper, cyanide, bromodichloromethane, dibromochloromethane, and mercury. The compliance schedule justification shall include all items specified by the SIP Section 2.1, Paragraph 3 (items (a) through (d)). Implementation of the new water quality based effluent limitations for bis (2-ethylhexyl) phthalate, cadmium, copper, cyanide, bromodichloromethane, dibromochloromethane, and mercury become effective on **1 July 2004** if a compliance schedule justification meeting the requirements of Section 2.1 of the SIP is not completed and submitted by the Discharger. Otherwise the new final water quality based effluent limitations for bis (2-ethylhexyl) phthalate, cadmium, copper, cyanide, bromodichloromethane, dibromochloromethane, and mercury required by this Order shall become effective on **1 April 2009.** As this schedule is greater than one year, the Discharger shall submit semi-annual progress reports on **15 April** and **15 October** each year until the Discharger achieves compliance with the final water quality based effluent limitations for bis (2-ethylhexyl) phthalate, cadmium, copper, cyanide, bromodichloromethane, dibromochloromethane, and mercury.

6. The Discharger shall comply with the following time schedule to assure compliance with tertiary treatment, or equivalent, requirement Effluent Limitations contained in C.3 of this Order:

Task	Compliance Date	Report of Compliance Due
Submit Annual Status Report		**1 February, annually**
Submit Workplan/Time Schedule		**23 March 2005**
Full Compliance	**1 April 2009**	

The Discharger shall submit to the Regional Board on or before each compliance report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

7. The interim limitations in this Order are based on the current treatment plant performance and have been established at the maximum observed concentration.

Interim limitations have been established since compliance with NTR- and CTR-based Effluent Limitations cannot be achieved by the existing discharge. The interim Effluent Limitations, C.2, establish enforceable mass and concentration ceilings until compliance with the final Effluent Limitations, C.3, can be achieved, which is required by **1 April 2009**.

8. The Discharger shall use the best practicable treatment or control technique currently available to limit mineralization to no more than a reasonable increment.

9. The Discharger shall report to the Regional Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986.

10. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions."

11. The Discharger shall comply with Monitoring and Reporting Program No. R5-2004-0045, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

    When requested by U.S.EPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharger Self Monitoring Reports.

12. This Order expires on **1 April 2009** and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.

13. **Within one year of adoption of this Order** the Discharger shall submit for Regional Board approval an Industrial Pretreatment Program, as more completely set forth in 40 CFR 403, the programs, and controls necessary to ensure that industrial discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction discharges from other sources:

    a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or

    b. Inhibit or disrupt treatment processes, treatment system operations, or sludge

processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

The Discharger shall enforce the Pretreatment Standards promulgated under Sections 307(b), 307(c) and 307(d) of the Clean Water Act. The Discharger shall perform the pretreatment functions required by 40 CFR Part 403 including but not limited to:

a. Enforcing the Pretreatment Standards of 40 CFR 403.5 and 403.6;

b. Implementing procedures to ensure compliance as required by 40 CFR 403.8(f)(2); and

c. Providing funding and personnel for implementation and enforcement of the pretreatment program as required by 40 CFR 403.8(f)(3).

The Discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this permit. If the Discharger fails to perform the pretreatment functions, the Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board (SWRCB) or the U.S. Environmental Protection Agency (U.S. EPA) may take enforcement actions against the Discharger as authorized by the Clean Water Act. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the necessary legal authorities, programs, and controls to ensure that incompatible wastes are not introduced to the treatment system.

14. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the necessary legal authorities, programs, and controls to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:

a. Wastes which create a fire or explosion hazard in the treatment works;

b. Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;

c. Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;

d. Any waste, including oxygen demanding pollutants (BOD, etc.), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;

e. Heat in amounts that inhibit or disrupt biological activity in the treatment works,

or that raise influent temperatures above 40°C (104°F), unless the Regional Board approves alternate temperature limits;

f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and

h. Any trucked or hauled pollutants, except at points predesignated by the Discharger.

15. The Discharger shall be responsible for ensuring that reclaimed water meets the quality standards of this Order and for the operation and maintenance in accordance with all applicable Title 22 requirements and this Order. The Discharger shall comply with the criteria established in Title 22. Uses of reclaimed water other than those identified in Title 22 are not regulated by this Order, are to be considered on a case-by-case basis and will be regulated under a separate Order.

16. The Discharger shall use the best practicable treatment and control, including application of recycled wastewater at agronomic rates, and proper operation and maintenance of the irrigation system, to comply with this Order.

17. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, limitation, specification or receiving water limitation the Discharger shall notify the Board by telephone within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Board waives confirmation. The written notification shall state the nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the current noncompliance and, prevent recurrence including, where applicable, a schedule of implementation.

18. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

19. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of, or clearance from the State Water Resources Control Board (Division of Water Rights).

20. Sanitary Sewer System Operation, Maintenance and Overflow Prevention. The Discharger shall maintain all portions of the wastewater collection system to assure compliance with this Order. Collection system overflows and/or discharges are prohibited by this Order. All violations of this Order must be reported as specified in Standard Provisions and the public shall be notified, in coordination with the Health Department, in areas that have been contaminated with sewage. All parties with a reasonable potential for exposure to a sewage overflow event shall be notified.

21. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

    To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Regional Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 23 April 2004.

_____
THOMAS R. PINKOS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0045

NPDES NO. CA0110299

FOR
THE UNITED STATES AIR FORCE, BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

This Monitoring and Reporting Program is issued pursuant to California Water Code Sections 13383 and 13267. The Discharger shall not implement any changes to this Monitoring and Reporting Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program. Specific sample station locations shall be established under direction of the Regional Board's staff, and a description of the stations shall be attached to this Order.

Section 13267 of the California Water Code states, in part, "*(a) A regional board, in establishing…waste discharge requirements…may investigate the quality of any waters of the state within its region"* and *"(b)(1) In conducting an investigation…, the regional board may require that nay person who… discharges… waste… that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires."* This Monitoring and Reporting Program to monitor groundwater required by Order No. R5-2004-0045 are necessary to assure compliance with Order No. R5-2004-0045. The Discharger operates the facility that discharges waste subject to Order No. R5-2004-0045.

INFLUENT MONITORING

Samples shall be collected at approximately the same time as effluent samples and should be representative of the influent for the period sampled. Influent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Sampling Frequency
20°C BOD_5	mg/l, lbs/day	24-hr. Composite	Weekly
Total Suspended Solids	mg/l, lbs/day	24-hr. Composite	Weekly
Flow	mgd	Meter	Continuous

EFFLUENT MONITORING

Effluent samples shall be collected during times of discharge to Hutchinson Creek. Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall. Effluent samples should be representative of the volume and quality of the discharge. Samples collected from the outlet structure of ponds will be considered adequately composited. Time of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Sampling Frequency
20°C BOD_5	mg/l, lbs/day	24-hr. Composite[1]	3 times weekly
Total Suspended Solids (TSS)	mg/l, lbs/day	24-hr. Composite[1]	3 times weekly
Settleable Solids	ml/l	24-hr. Composite[1]	3 times weekly
Total Dissolved Solids (TDS)	mg/l, lbs/day	24-hr. Composite[1]	monthly
Electrical Conductivity @25°C	µmhos/cm	Grab	3 times weekly
pH	Number	Meter	3 times weekly
Acute Toxicity[2,3]	% Survival	Grab	Every other month
Total Coliform Organisms	MPN/l00 ml	Grab	3 times weekly
Total Chlorine Residual	mg/l, lbs/day	Meter	Continuous
Flow	mgd	Meter	Continuous
Temperature	°F	Grab	3 times weekly
Ammonia[4,5,6]	mg/l, lbs/day	Grab	3 times weekly
Turbidity	NTU	Meter	Continuous
Bis(2-ethylhexyl)phthalate	µg/l, lbs/day	Grab	Monthly
Cadmium (Total Recoverable)	µg/l, lbs/day	24-hr. Composite	Monthly
Copper (Total Recoverable)	µg/l, lbs/day	24-hr. Composite	Monthly
Cyanide (Total Recoverable)	µg/l, lbs/day	24-hr. Composite	Monthly
Mercury (Total Recoverable)	µg/l, lbs/day	24-hr. Composite	Monthly
Dibromochloromethane	µg/l, lbs/day	Grab	Monthly
Bromodichloromethane	µg/l, lbs/day	Grab	Monthly
Aluminum[9] (Total Recoverable)	µg/l, lbs/day	24-hr. Composite	Monthly
Methylene Blue Active Substances (MBAS)	mg/l, lbs/day	Grab	Monthly

Constituents	Units	Type of Sample	Sampling Frequency
Iron (Total Recoverable)	µg/l, lbs/day	24-hr. Composite	Monthly
Oil and Grease	mg/l, lbs/day	Grab	Monthly
Nitrate (as N)	µg/l, lbs/day	Grab	Monthly
Nitrite (as N)	µg/l, lbs/day	Grab	Monthly
Total Petroleum Hydrocarbons	µg/l, lbs/day	Grab	Monthly
Priority Pollutants[7,8]	mg/l, lbs/day	Grab	Annually

[1] The BOD and TSS samples shall be flow proportional composite samples.
[2] The acute bioassays samples shall be analyzed using EPA/600/4-90/027F, Fourth Edition, or later amendment with Regional Board staff approval. Temperature and pH shall be recorded at the time of bioassay sample collection. Test species shall be fathead minnows (Pimephales promelas), with no pH adjustment unless approved by the Executive Officer.
[3] Concurrent with ammonia sampling.
[4] Concurrent with biotoxicity monitoring.
[5] Report as both total and un-ionized ammonia.
[6] Temperature and pH shall be recorded at the time of ammonia sample collection.
[7] Temperature, pH, and hardness data shall be collected at the same time and on the same date as the Priority Pollutant samples.
[8] Priority Pollutants is defined as U.S.EPA priority toxic pollutants and consists of the constituents listed in the Attachment II of the "13267 letter", which was issued by the Executive Officer on 10 September 2001, in conformance with California Water Code, Section 13267.
[9] Compliance can be demonstrated using either total, or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

RECEIVING WATER MONITORING

Receiving water samples shall be collected during times of discharge to Hutchinson Creek. All receiving water samples shall be grab samples. Receiving water monitoring shall include at least the following:

Station	Description

R-l	400 feet upstream from the point of discharge
R-2	1,000 feet downstream from the point of discharge

Constituents	Units	Station	Sampling Frequency
Dissolved Oxygen	mg/l	R-l, R-2	Weekly
pH	Number	R-l, R-2	Weekly
Turbidity	NTU	R-l, R-2	Monthly
Temperature	°F (°C)	R-l, R-2	Weekly
Electrical Conductivity @25°C	µmhos/cm	R-1, R-2	Weekly
Total Coliform Organisms	MPN/100 ml	R-1, R-2	Monthly
Ammonia[1]	mg/l	R-1, R-2	Quarterly

[1] Temperature and pH shall be determined at the time of sample collection for the calculation of unionized ammonia.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-l and R-2. Attention shall be given to the presence or absence of:

a. Floating or suspended matter
b. Discoloration
c. Bottom deposits
d. Aquatic life
e. Visible films, sheens or coatings
f. Fungi, slimes, or objectionable growths
g. Potential nuisance conditions

Notes on receiving water conditions shall be summarized in the monitoring report.

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing toxicity to the receiving water. The testing shall be conducted as specified in EPA 600/4-91/002. Chronic toxicity samples shall be collected at the discharge of the wastewater treatment plant prior to its entering Hutchinson Creek. Twenty-four hour composite samples shall be representative of the volume and quality of the discharge. Time of collection samples shall be recorded. Standard dilution water can be used if the receiving water source exhibits toxicity and is approved by the Executive Officer. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay and reported with the test results.

Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test within 14 days. Chronic toxicity monitoring shall include the following:

Species:	*Fathead minnows (Pimephales promelas), Ceriodaphnia dubia, and Selenastrum capricornutum*
Frequency:	*Monitoring shall be performed while discharging to Hutchinson Creek and for intermittent discharges, upon initiation of discharge.*
Dilution Series:	*None*

SLUDGE MONITORING

A composite sample of sludge shall be collected annually in accordance with EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989, and tested for the following metals:

Cadmium	Copper	Nickel	Molybdenum
Chromium	Lead	Zinc	Mercury
Selenium	Silver		

Sampling records shall be retained for a minimum of five years. A log shall be kept of sludge quantities generated and of handling and disposal activities. The frequency of entries is discretionary; however, the log should be complete enough to serve as a basis for part of the annual report.

1. **Within 90 days of the effective date of this Order**, and **annually by 30 January** thereafter, the Discharger shall submit:

   a. Annual sludge production in dry tons and percent solids.

   b. A schematic diagram showing sludge handling facilities and a solids flow diagram.

   c. Depth of application and drying time for sludge drying beds.

   d. A description of disposal methods, including the following information related to the disposal methods used at the facility. If more than one method is used, include the percentage of annual sludge production disposed by each method.

Within 90 days of the effective date of this Order, the Discharger shall submit characterization of sludge quality, including sludge percent solids and quantitative results of chemical analysis for

the priority pollutants listed in 40 CFR 122 Appendix D, Tables II and III (excluding total phenols). All sludge samples shall be a composite of a minimum of twelve (12) discrete samples taken at equal time intervals over 24 hours. Suggested methods for analysis of sludge are provided in EPA publications titled "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods" and "Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater". Recommended analytical holding times for sludge samples should reflect those specified in 40 CFR 136.6.3(e). Other guidance is available in EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989.

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring shall include at least the following:

Constituents	Units	Sampling Frequency
Electrical Conductivity[1] @ 25°C	µmhos/cm	Annually
Total Dissolved Solids	mg/l	Annually

[1] If the water supply is from more than one source, the EC shall be reported as a weighted average and include copies of supporting calculations.

GROUNDWATER MONITORING

Prior to construction, plans and specifications for ground water monitoring wells shall be submitted to Regional Board staff for review and approval. Wells shall comply with requirements of the Department of Water Resources.

Constituents	Units	Sampling Frequency
Depth to Groundwater	feet/100	Monthly
Elevation[1]	feet/100	Monthly
Specific Conductivity	µmhos/cm	Monthly
Nitrate (as N)	mg/l	Quarterly
Total Coliform Organisms	MPN/100 ml	Quarterly

[1] The elevation shall be used to calculate the gradient and direction of groundwater flow which shall be reported with the monitoring report.

STORAGE PONDS MONITORING

The Effluent Pond and the Golf Course Pond[1] shall be monitored for at least the followings:

Constituents	Units	Sampling Frequency
Freeboard	Feet	monthly
Specific Conductivity	µmhos/cm	monthly
Color	observation	monthly
Odors	observation	monthly
Levee Condition	observation	monthly

[1] The Golf Course Pond shall only be monitored during times when the wastewater is routed to or stored in the Golf Course Pond.

GOLF COURSE MONITORING

Monitoring of the effluent recycling site (golf course) shall be conducted daily during periods when the wastewater treatment plant effluent is applied to the Golf Course, and the results shall be included in the monthly monitoring report. Evidence of erosion, saturation, irrigation runoff, or the presence of nuisance conditions shall be noted in the report. Effluent monitoring results shall be used in calculations to ascertain loading rates at the application area. Monitoring of the golf course shall include the following:

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Flow[1]	mgd	Continuous	Daily	Monthly
Rainfall	Inches	Observation	Daily	Monthly
Application Rate [2]	gal/acre/day	Calculated	Daily	Monthly
Total Nitrogen Loading Rate[2]	lbs/ac/month	Calculated	Monthly	Monthly
Total Dissolved Solids Loading Rate [2]	lbs/ac/month	Calculated	Monthly	Monthly

[1] Flow measurement shall be provided for effluent being supplied to the golf course
[2] For each land application area

The entire irrigated area shall be periodically inspected during or immediately following an irrigation event to identify any equipment malfunction or other circumstances that might allow irrigation runoff to leave the irrigation area and/or create ponding conditions that violate the Waste Discharge Requirements. A daily log of these inspections shall be kept at the facility and made available for review upon request.

REPORTING

Monitoring results shall be submitted to the Regional Board by the **first day** of the second month following sample collection. Quarterly and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter, semi-annual period, and year**, respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., influent, effluent, storage pond, golf course, etc.), the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and removal efficiencies (%) for BOD and Suspended Solids, should be determined and recorded.
If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

By **30 January** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

a. The names, certificate grades, and general responsibilities of all persons employed at the WWTP (Standard Provision A.5).

b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.

a. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).

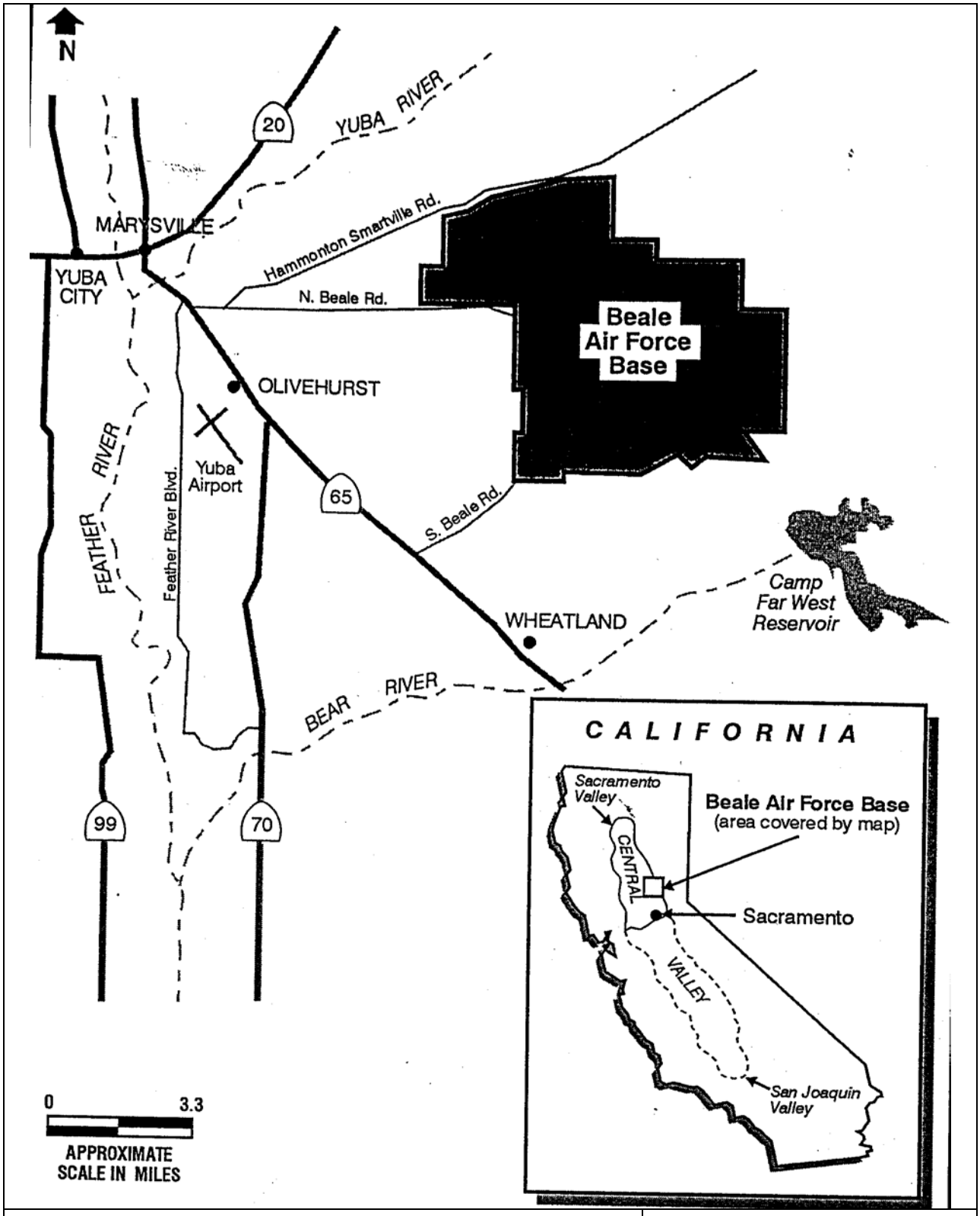
d. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.

The Discharger may also be requested to submit an annual report to the Regional Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.
All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

The Discharger shall implement the above monitoring program on the first day of the month following effective date of this Order.

Ordered by: THOMAS R. PINKOS, Executive Officer

23 April 2004
(Date)



SITE LOCATION MAP

THE UNITED STATES AIR FORCE, BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

N
W E
S

approximate scale
1 in. = 3.3 miles

CONTINUOUS CONCENTRATION
30-DAY AVERAGE CONCENTRATIONS OF AMMONIA

Total Ammonia Concentration (mg N/l)										
	Temperature, ºC (ºF)									
pH	**0** (32)	**14** (57)	**16** (61)	**18** (64)	**20** (68)	**22** (72)	**24** (75)	**26** (79)	**28** (82)	**30** (86)
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) x\ MIN\left(2.85, 1.45 \cdot 10^{0.028(25-T)}\right)$$

where

CCC = criteria continuous concentration (mg N/l)
T = temperature (ºC)

ONE-HOUR AVERAGE CONCENTRATIONS OF AMMONIA

pH	Total Ammonia Concentrations (mg N/l)
6.5	32.6
6.6	31.3
6.7	29.8
6.8	28.0
6.9	26.2
7.0	24.1
7.1	21.9
7.2	19.7
7.3	17.5
7.4	15.3
7.5	13.3
7.6	11.4
7.7	9.64
7.8	8.11
7.9	6.77
8.0	5.62
8.1	4.64
8.2	3.83
8.3	3.15
8.4	2.59
8.5	2.14
8.6	1.77
8.7	1.47
8.8	1.23
8.9	1.04
9.0	0.885

where

$$CMC_{salmonids\ present} = \left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}} \right)$$

CMC = criteria maximum concentration (mg N/l)

Hardness-Dependent Effluent Limitation for Cadmium (expressed as total recoverable metal)

Hardness (as $CaCO_3$)	Average Monthly, AMEL (µg/l)	Maximum Daily, MDEL (µg/l)	Hardness (as $CaCO_3$)	Average Monthly, AMEL (µg/l)	Maximum Daily, MDEL (µg/l)	Hardness (as $CaCO_3$)	Average Monthly, AMEL (µg/l)	Maximum Daily, MDEL (µg/l)
<25	Calculate	Calculate	100	2.02	4.04	260	4.27	8.56
25	0.47	0.95	110	2.17	4.36	270	4.40	8.82
30	0.58	1.16	120	2.33	4.67	280	4.52	9.08
35	0.69	1.38	130	2.48	4.97	290	4.65	9.33
40	0.80	1.61	140	2.63	5.27	300	4.78	9.58
45	0.91	1.84	150	2.77	5.56	310	4.90	9.83
50	1.03	2.07	160	2.92	5.85	320	5.02	10.08
55	1.15	2.30	170	3.06	6.13	330	5.15	10.33
60	1.27	2.54	180	3.20	6.42	340	5.27	10.57
65	1.39	2.78	190	3.34	6.69	350	5.39	10.82
70	1.51	3.02	200	3.47	6.97	360	5.51	11.06
75	1.61	3.23	210	3.61	7.24	370	5.63	11.30
80	1.69	3.39	220	3.74	7.51	380	5.75	11.54
85	1.77	3.56	230	3.88	7.78	390	5.87	11.77
90	1.86	3.72	240	4.01	8.04	400	5.99	12.01
95	1.94	3.88	250	4.14	8.30	>400	Calculate	Calculate

$$CCC = e^{\{0.7852[\ln(hardness)]-2.715\}}$$

$$CMC = e^{\{1.128[\ln(hardness)]-3.6867\}}$$

$$AMEL = 1.55[\min(0.321ECA_{acute}, 0.527ECA_{chronic})]$$

$$MDEL = 3.11[\min(0.321ECA_{acute}, 0.527ECA_{chronic})]$$

$$ECA_{acute} = CMC$$

$$ECA_{chronic} = CCC$$

where

CCC = criteria continuous concentration
CMC = criteria maximum concentration
ECA = effluent concentration allowance
AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation

Hardness-Dependent Effluent Limitation for Copper (expressed as total recoverable metal)

Hardness (as $CaCO_3$)	Average Monthly, AMEL (µg/l)	Maximum Daily, MDEL (µg/l)	Hardness (as $CaCO_3$)	Average Monthly, AMEL (µg/l)	Maximum Daily, MDEL (µg/l)	Hardness (as $CaCO_3$)	Average Monthly, AMEL (µg/l)	Maximum Daily, MDEL (µg/l)
<25	Calculate	Calculate	100	5.8	14.0	260	14.3	34.4
25	1.6	3.8	110	6.4	15.3	270	14.8	35.7
30	1.9	4.5	120	6.9	16.6	280	15.4	36.9
35	2.2	5.2	130	7.5	17.9	290	15.9	38.2
40	2.5	5.9	140	8.0	19.2	300	16.4	39.4
45	2.7	6.6	150	8.5	20.5	310	16.9	40.6
50	3.0	7.3	160	9.1	21.8	320	17.4	41.9
55	3.3	8.0	170	9.6	23.1	330	17.9	43.1
60	3.6	8.7	180	10.1	24.4	340	18.4	44.3
65	3.9	9.3	190	10.7	25.6	350	19.0	45.6
70	4.2	10.0	200	11.2	26.9	360	19.5	46.8
75	4.4	10.7	210	11.7	28.2	370	20.0	48.0
80	4.7	11.3	220	12.2	29.4	380	20.5	49.2
85	5.0	12.0	230	12.8	30.7	390	21.0	50.5
90	5.3	12.7	240	13.3	31.9	400	21.5	51.7
95	5.5	13.3	250	13.8	33.2	>400	Calculate	Calculate

$$CCC = e^{\{0.8545[\ln(hardness)]-1.702\}}$$

$$CMC = e^{\{0.9422[\ln(hardness)]-1.700\}}$$

$$AMEL = 1.84[\min(0.226 ECA_{acute}, 0.407 ECA_{chronic})]$$

$$MDEL = 4.42[\min(0.226 ECA_{acute}, 0.407 ECA_{chronic})]$$

$$ECA_{acute} = CMC$$

$$ECA_{chronic} = CCC$$

where

CCC = criteria continuous concentration
CMC = criteria maximum concentration
ECA = effluent concentration allowance
AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation

INFORMATION SHEET

ORDER NO. R5-2004-0045
NPDES NO. CA0110299
THE UNITED STATES AIR FORCE, BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

BACKGROUND INFORMATION

Beale Air Force Base (AFB) includes 22,944 acres of land in the Sacramento Valley and the lower foothills of the Sierra Nevada Mountains. The military installation is located ten miles east of Marysville and 45 miles north of Sacramento. Beale AFB is divided into three distinct areas. The flight line area is located west of the Base and consists of runway, hangers, fuel supporting facilities, fire department, and shops that directly support the flying missions. The cantonment area is located in the Base's central region and comprises of Base support functions such as administrative buildings, recreational facilities, civil engineering, the commissary, and Base Exchange. The eastern portion of the Base includes Military Family Housing, the Base Hospital, and a ballistic missile radar detection system.

Beale AFB (Discharger) owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to domestic and industrial users. The effluent waste stream from the wastewater treatment plant is discharged to Hutchinson Creek (Outfall No.001). Hutchinson Creek flows to the Western Pacific Interceptor Drainage Canal, which is tributary to the Bear River. Treated wastewater is also discharged to the golf course. According to the Discharger, golf course irrigation is the highest priority use of the treated effluent, followed by the discharge to Pond #4 and irrigation, with surface water disposal to Hutchinson Creek being the lowest priority. Wastewater effluent discharged to Pond #4 is currently regulated under separate Waste Discharger Requirements, Order No. 5-01-087. Pond #4 and the land application field were constructed for holding and disposal of wastewater when it is not needed for the Golf Course. Since 21 February 2002, all wastewater has been routed to the Golf Course Pond (Outfall No.002) or Pond #4 and there has been no discharge to Hutchinson Creek. Irrigation of the 120-acre golf course occurs while golfers are not on the course. The Golf Course Pond is located northeast of the wastewater treatment plant and to the west of the Golf Course. Golf course irrigation tends to occur during the summer months. Discharge to Hutchinson Creek occurred primarily during the winter months. The current design capacity of the wastewater treatment plant is 5.0 million gallons per day (mgd) and the average daily dry weather flow rate is 0.76 mgd.

BENEFICIAL USES OF THE RECEIVING WATER

The Basin Plan states, on page II-1.00, "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning" and "…disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses." The existing and potential beneficial uses that currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1 of the Basin Plan.

Hutchinson Creek is tributary to the Western Pacific Interceptor Drainage Canal, which flows into the Bear River. Hutchinson Creek is an ephemeral stream with very low to no flow. The impact of considering a receiving stream to be ephemeral is that all limitations are "end of pipe" without any benefit of dilution.

The effluent is discharged to Hutchinson Creek (Outfall No. 001), approximately ten miles from the confluence with the Western Pacific Interceptor Drainage Canal. The outfall location is described as latitude 39° 5' 16" longitude 121° 25' 30". From the confluence with Hutchinson Creek, the Western Pacific Interceptor Drainage Canal then flows to approximately five miles to its confluence with the Bear River. The beneficial uses of Hutchinson Creek and the Western Pacific Interceptor Drainage Canal are not specifically identified in the Basin Plan. However, the Basin Plan states that "…beneficial uses of any specifically identified water body generally apply to its tributary streams." Based on a review of beneficial uses of Hutchinson Creek, the beneficial uses identified in the Basin Plan for the Bear River are applicable to Hutchinson Creek. The beneficial uses of the Bear River are domestic and municipal supply, agricultural irrigation, agricultural stock watering, industry power supply, water contact recreation including canoeing and rafting recreation, non-contact water recreation including aesthetic enjoyment, warm and cold freshwater habitats, potential warm and cold fish migration habitat, potential warm and cold spawning habitat, and wildlife habitat.

Hutchinson Creek flows to the Western Pacific Interceptor Drainage Canal, the Bear River, and the Feather River. By the Basin Plan Tributary Rule, Hutchinson Creek has been designated to have a cold freshwater habitats beneficial use. The California Department of Fish and Game (DFG) has recorded the presence of adult salmonids and juveniles non-natal rearing in Hutchinson Creek and the Western Pacific Interceptor Drainage Canal and anadromous fish species in Reeds Creek, a tributary to the Western Pacific Interceptor Drainage Canal. Regional Board staff also observed the presence of fish at the Western Pacific Interceptor Drainage Canal and at the confluence of the Bear River and the Western Pacific Interceptor Drainage Canal.

For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/l of dissolved oxygen. Since, by the Tributary Rule, the beneficial use of COLD does apply to Hutchinson Creek, a receiving water limitation for dissolved oxygen is included in this Order.

NO AVAILABLE DILUTION FOR THE RECEIVING WATER

The Regional Board finds that based on the available information, that Hutchinson Creek, absent the discharge, is an ephemeral stream. The ephemeral nature of Hutchinson Creek means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flows within Hutchinson Creek help support the aquatic life. Both conditions may exist within a short time span, where Hutchinson Creek would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Bear River. Dry conditions occur primarily in the summer months, but dry conditions may also occur throughout the year,

particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water standards, agricultural water quality goals and aquatic life. Significant dilution may occur during and immediately following high rainfall events.

REASONABLE POTENTIAL ANALYSIS FOR EFFLUENT LIMITATIONS– CTR CONSTITUENTS

The Code of Federal Regulations, 40 CFR 122.44 (d)(1)(iii), states: "…a discharge causes, has a reasonable potential to cause, or contribute to an in-stream excursion above allowable ambient concentration of a State numeric criteria within a State water quality standard for an individual pollutant, the permit must contain effluent limits for that pollutant."

All mass-based Effluent Limitations are calculated using the following equation:

$$X\frac{mg}{l}\times 8.345\times Flow(mgd)=Y\frac{lbs}{day} \qquad (*)$$

where

X = Concentration-based Effluent Limitation
Y = Mass-based Effluent Limitation

All maximum detected effluent sampling results and controlling water quality criteria for CTR constituents are summarized in the table below:

Constituents	Maximum Detected Concentration (µg/l)	Controlling Water Quality Criteria	Reasonable Potential?
Arsenic	1.7	Primary Maximum Contaminant Level	No
Bis(2-ethylhexyl)phthalate	53	U.S. EPA NTR Human Health Criteria	Yes
Cadmium	5.0	U.S. EPA CTR Freshwater Aquatic Life Criteria	Yes
Chromium (III)	1.3	U.S. EPA NTR Freshwater Aquatic Life Criteria	No
Copper	38	U.S. EPA CTR Freshwater Aquatic Life Criteria	Yes
Cyanide	37	U.S. EPA CTR Freshwater Aquatic Life Criteria	Yes
Bromodichloromethane	2.7	U.S. EPA CTR Human Health Criteria	Yes
Dibromochloromethane	0.89	U.S. EPA CTR Human Health Criteria	Yes
Di-n-butylphthalate	3.0	U.S. EPA NTR Human Health Criteria	No
Mercury	0.5	U.S. EPA CTR Human Health Criteria	Yes
Nickel	4.4	U.S. EPA CTR Human Health Criteria	No
Pyrene	0.27	U.S. EPA CTR Human Health Criteria	No
Zinc	17	U.S. EPA CTR Freshwater Aquatic Life Criteria	No

Arsenic

Arsenic is a toxic substance that is known to cause adverse human health effects. Exposure to arsenic at high levels poses serious health effects as it is a known human carcinogen. Studies have shown that prolonged arsenic exposure significantly increases the risk of contracting various forms of cancer. In addition, it has been reported to affect the vascular system in humans and has been associated with the development of diabetes.

Arsenic can combine with other elements to form inorganic and organic arsenicals. In the environment, arsenic combines readily with many elements to form inorganic compounds: with hydrogen to form arsine, an extremely poisonous gas; with oxygen to form a pentoxide and trioxide (As_2O_3 or As_4O_6), a deadly poison also called arsenic (III) oxide, arsenious oxide, white arsenic, or, simply, arsenic; with the halogens; and with sulfur. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds. Organic arsenic compounds are less toxic than inorganic arsenic compounds. While food contains both inorganic and organic arsenicals, primarily inorganic forms are present in water. Exposure to high levels of some organic arsenic compounds may cause similar effects as inorganic arsenic.

Analytical data provided by the Discharger indicate that arsenic was detected at a maximum effluent concentration of 1.7 µg/l. Pursuant to the Basin Plan Tributary Rule, the municipal and domestic water supply beneficial use designation of the Bear River is applied to Hutchinson Creek. For beneficial use that is designated as municipal water and domestic water supply, the Basin Plan prohibits the discharge that contains chemicals in concentrations that exceed California drinking water Maximum Contaminant Levels (MCLs) and toxic substances in toxic amounts. U.S. EPA freshwater aquatic life CTR criteria for arsenic are 150 µg/l (as a four-day average) and 340 µg/l (as a one-hour average). On 31 October 2001, U.S. EPA adopted a new drinking water standard for arsenic. The new Primary MCL for arsenic is 10 µg/l. The current The drinking water standards and human health criteria for arsenic are lower than the aquatic life CTR criteria. Therefore, to protect the municipal and domestic beneficial uses, drinking water standards or human health criteria shall be used to establish effluent limitations.

While it is possible that there is hydraulic assimilative capacity for the discharge, there is no information for regarding available dilution for arsenic. Therefore, it must be assumed that no dilution exists, and the effluent limitation for arsenic in this Order will be established as an end-of-pipe limitation at the MCL.

The maximum detected concentration of arsenic does not exceed any water quality criteria. Therefore, no effluent limitation for arsenic is included in this Order.

Bis(2-ethylhexyl)phthalate

Bis(2-ethylhexyl)phthalate is a colorless oily liquid that is extensively used as a plasticizer in a wide variety of industrial, domestic, and medical products. It is an environmental contaminant and has been detected in groundwater, surface water, drinking water, azir, soil, plants, fish, and animals.

Bis(2-ethylhexyl)phthalate is in polyvinyl chloride plastic products like toys, vinyl upholstery, shower curtains, adhesives, and coatings. Bis(2-ethylhexyl)phthalate is also used in inks, pesticides, cosmetics, and vacuum pump oil. Bis(2-ethylhexyl)phthalate is insoluble in water, miscible with mineral oil and hexane, and soluble in most organic solvents. It is easily dissolved in body fluids such as plasma. Bis(2-ethylhexyl)phthalate is a combustible liquid; it may burn, but does not readily ignite. It produces poisonous gas in a fire. When heated to decomposition, it emits acrid smoke. The Department of Health and Human Services has determined that bis(2-ethylhexyl)phthalate may reasonably be anticipated to be a carcinogen. Repeated exposure to bis(2-ethylhexyl)phthalate may affect kidneys and livers.

Analytical data provided by the Discharger indicate that bis(2-ethylhexyl)phthalate was detected in 39 of 56 effluent samples. Bis(2-ethylhexyl)phthalate was detected at a maximum effluent concentration of 53 µg/l. U.S. EPA human health NTR criteria are 1.8 µg/l (for waters from which both water and aquatic organisms are consumed) and 5.9 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average. The maximum detected concentration of bis(2-ethylhexyl)phthalate exceeds human health NTR criteria. Therefore, the discharge from the Beale AFB WWTP has a reasonable potential to cause or contribute to an exceedance of human health NTR criteria for bis(2-ethylhexyl)phthalate. This Order contains an average monthly concentration-based Effluent Limitation of 1.8 µg/l for bis(2-ethylhexyl)phthalate based on the human health NTR criterion.

The State Board adopted the SIP on 2 March 2000 and amended it on 26 April 2000. The SIP includes methodology for establishing effluent limitations for priority toxic pollutants included in the NTR and CTR. The SIP includes the following equation for calculating the maximum daily effluent limitation (MDEL) when the applicable criteria are for the protection of human health:

$$MDEL_{hh} = ECA * \left(\frac{MDEL}{AMEL} \right)_{multiplier}$$

where

ECA = Effluent concentration allowance
ECA = Average monthly effluent limitation (for the protection of human health)
AMEL = Average monthly effluent limitation
$MDEL_{hh}$ = Maximum daily effluent limitation (for the protection of human health)

Using the equation above, the maximum daily concentration-based Effluent Limitation for bis(2-ethylhexyl)phthalate is calculated at 5.4 µg/l.

In addition, this Order contains average monthly and maximum daily mass-based Effluent Limitations of 0.075 lbs/day and 0.23 lbs/day, calculated using the equation (*). A time schedule has been included in this Order for compliance with bis(2-ethylhexyl)phthalate limitation.

Cadmium

Analytical data provided by the Discharger indicate that cadmium was detected in the effluent at a maximum concentration of 5.0 µg/l.

U.S. EPA developed hardness-dependent freshwater aquatic life CTR criteria for cadmium. U.S. EPA recommended conversion factors (CF) to translate dissolved concentrations to total concentrations. Conversion factors based on the hardness in freshwater are calculated using the following equations:

$$CF_C = \left(1.101672 - \{[\ln(hardness)] \times 0.041838\}\right)$$
$$CF_A = \left(1.136672 - \{[\ln(hardness)] \times 0.041838\}\right)$$

where

CF_C = conversion factor for chronic criteria
CF_A = conversion factor for acute criteria

The continuous concentration (four-day average) and the maximum concentration (one-hour average) criteria for cadmium are presented in total concentrations. These criteria are presented as follows:

$$CCC = e^{\{0.7852[\ln(hardness)] - 2.715\}}$$
$$CMC = e^{\{1.128[\ln(hardness)] - 3.6867\}}$$

where

CCC = criteria continuous concentration (four-day average)
CMC = criteria maximum concentration (one-hour average)

Since hardness data of the receiving stream were not available, the lowest measured hardness from the effluent of 100 mg/l is used to determine the hardness-dependent criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average). Using above equations, the hardness-dependent criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average) are calculated at 2.5 µg/l and 4.5 µg/l, respectively.

The maximum detected concentration of cadmium exceeds freshwater aquatic life CTR criteria. It indicates that the discharge from the Beale AFB WWTP does have a reasonable potential to cause or contribute to an exceedance of CTR criteria for cadmium.

The State Board adopted the SIP on 2 March 2000 and amended it on 26 April 2000. The SIP includes methodology for establishing effluent limitations for priority toxic pollutants included in the NTR and CTR. The SIP includes following equations for calculating the daily maximum and monthly average effluent limitations where applicable water quality criteria are for the protection of freshwater aquatic life:

LTA_{acute} = ECA_{acute} * ECA $multiplier_{acute99}$
$LTA_{chronic}$ = $ECA_{chronic}$ * ECA $multiplier_{chronic99}$
$AMEL_{aquatic\ life}$ = $LTA_{min}(LTA_{acute}, LTA_{chronic})$* AMEL $multiplier_{95}$
$MDEL_{aquatic\ life}$ = $LTA_{min}(LTA_{acute}, LTA_{chronic})$* MDEL $multiplier_{99}$

where

ECA_{acute} = Effluent Concentration Allowance for Acute Condition = 4.5 µg/l
$ECA_{chronic}$ = Effluent Concentration Allowance for Chronic Condition = 2.5 µg/l
ECA $multiplier_{acute99}$ = Multiplying Factor Adjusted for Effluent Variability (for Acute Condition) = 0.321
ECA $multiplier_{chronic99}$ = Multiplying Factor Adjusted for Effluent Variability (for Chronic Condition) = 0.527
LTA_{acute}, $LTA_{chronic}$ = Long-term Average Discharge Condition for Acute and Chronic Conditions
$AMEL_{aquatic\ life}$ = Average Monthly Effluent Limitation
$MDEL_{aquatic\ life}$ = Maximum Daily Effluent Limitation

This Order includes hardness-dependent average monthly and maximum daily concentration-based Effluent Limitations (presented in total concentration) calculated using above equations for cadmium. In addition, this Order also includes average monthly and maximum daily mass-based Effluent Limitations for cadmium calculated using the equation (*). A time schedule has been included in this Order for compliance with the cadmium limitation.

Chromium (III)

Chromium is a naturally occurring element found in rocks, animals, plants, soil, and in volcanic dust and gases. Total chromium measures the combined levels of trivalent chromium (chromium III) and hexavalent chromium (chromium VI). Chromium (III) occurs naturally in the environment and is an essential nutrient. Chromium (VI) is generally produced by industrial processes, such as chrome plating, dyes and pigments, leather tanning, and wood preserving. There is evidence to suggest that chromium (VI) may be converted to chromium (III) in the human body; particularly in the acidic environment of the digestive system. In addition, chromium (III) is the most stable form. Therefore, total chromium in the effluent is likely to be in the chromium (III) form. Based on these considerations, water quality standards for chromium (III) are used to evaluate whether detected concentrations of chromium (III) in the discharge from the Beale AFB WWTP cause or contribute to an exceedance of a water quality standard.

Analytical data provided by the Discharger included monitoring results for chromium (total) and chromium (VI). Detected concentrations of chromium (III) are calculated by taking the difference of chromium (VI) concentration from the chromium (total) concentration. Detected concentrations of chromium (III) are presented in the following table:

Sampling Dates	Unit	Chromium (total)	Chromium (VI)	Chromium (III)
9/10/02	µg/l	1.8	0.5	1.3
10/8/02	µg/l	1.7	0.5	1.2

U.S. EPA developed hardness-dependent freshwater aquatic life NTR criteria for chromium. U.S. EPA recommended conversion factors to translate dissolved concentrations to total concentrations. Conversion factors for chromium (III) in freshwater are 0.316 and 0.860 for acute and chronic criteria, respectively. Continuous concentration (four-day average) and maximum concentration (one-hour average) criteria for chromium are presented in total concentrations. These criteria are determined using the following equations:

$$CCC = e\{0.819[\ln(hardness)] + 1.561\} \qquad CMC = e\{0.819[\ln(hardness)] + 3.688\}$$

where

CCC = criteria continuous concentration (four-day average)
CMC = criteria maximum concentration (one-hour average)

Since hardness data of the receiving stream were not available, the lowest reported hardness of 100 mg/l collected from the effluent is used to determine the criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average). Using above equations, the hardness-dependent criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average) are calculated at 207 µg/l and 1,737 µg/l, respectively.

Detected concentrations of chromium (III) do not exceed freshwater aquatic life NTR criteria for chromium (III). Therefore, no effluent limitation for chromium (III) is included in this Order.

Copper

Analytical data provided by the Discharger indicate that copper was detected in 37 of 64 effluent samples. The maximum detected effluent concentration of copper was reported at 38 µg/l. The CTR freshwater aquatic life hardness-dependent criteria for copper are presented in dissolved concentrations. U.S. EPA recommended conversion factors to translate dissolved concentrations to total concentrations. The conversion factor for copper in fresh water is 0.960 for both acute and chronic criteria. The continuous concentration (four-day average) and the maximum concentration (one-hour average) criteria for copper are presented in total concentrations. The

criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average) are calculated using the following equations:

$$CCC = e^{\{0.8545[\ln(hardness)]-1.702\}}$$
$$CMC = e^{\{0.9422[\ln(hardness)]-1.700\}}$$

where

CCC = criteria continuous concentration (four-day average)
CMC = criteria maximum concentration (one-hour average)

Since hardness data of the receiving stream were not available, the lowest measured hardness from the effluent of 100 mg/l is used to determine the criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average). Using above equations, the hardness-dependent criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average) are calculated at 9.3 µg/l and 14 µg/l, respectively.

U.S. EPA human health CTR criterion is 1,300 µg/l (for waters from which both water and aquatic organisms are consumed) as a 30-day average. The maximum detected concentration of copper exceeds freshwater aquatic life CTR criteria. Therefore, it indicates that the discharge from the Beale AFB WWTP does have a reasonable potential to cause or contribute to an exceedance of freshwater aquatic life CTR criteria for copper.

The State Board adopted the SIP on 2 March 2000 and amended it on 26 April 2000. The SIP includes methodology for establishing effluent limitations for priority toxic pollutants included in the NTR and CTR. The SIP includes following equations for calculating the maximum daily and average monthly effluent limitations where applicable water quality criteria are for the protection of freshwater aquatic life:

LTA_{acute} = ECA_{acute} * ECA $multiplier_{acute99}$
$LTA_{chronic}$ = $ECA_{chronic}$ * ECA $multiplier_{chronic99}$
$AMEL_{aquatic\ life}$ = $LTA_{min}(LTA_{acute}, LTA_{chronic})$* AMEL $multiplier_{95}$
$MDEL_{aquatic\ life}$ = $LTA_{min}(LTA_{acute}, LTA_{chronic})$* MDEL $multiplier_{99}$

where

ECA_{acute} = Effluent Concentration Allowance for Acute Condition = 14 µg/l
$ECA_{chronic}$ = Effluent Concentration Allowance for Chronic Condition = 9.3 µg/l
ECA $multiplier_{acute99}$ = Multiplying Factor Adjusted for Effluent Variability (for Acute Condition) = 0.226
ECA $multiplier_{chronic99}$ = Multiplying Factor Adjusted for Effluent Variability (for Chronic Condition) = 0.407
LTA_{acute}, $LTA_{chronic}$ = Long-term Average Discharge Condition for Acute and Chronic Conditions

$AMEL_{aquatic\ life}$ = Average Monthly Effluent Limitation
$MDEL_{aquatic\ life}$ = Maximum Daily Effluent Limitation

This Order includes hardness-dependent average monthly and maximum daily concentration-based Effluent Limitations (presented in total concentration) calculated using above equations for copper. In addition, this Order also includes average monthly and maximum daily mass-based Effluent Limitations for copper calculated using the equation (*). A time schedule has been included in this Order for compliance with the copper limitation.

Cyanide

Cyanide most commonly occurs as hydrogen cyanide and its salts-sodium and potassium cyanide. Cyanides are both man-made and naturally occurring substances. They are found in several plan species as cyanogenic glycosides and are produced by certain bacteria, fungi, and algae. Cyanides are released to the environment from industrial sources and car emissions.

Analytical data provided by the Discharger indicate that cyanide was detected in 20 of 65 effluent samples. The maximum detected effluent concentration of cyanide was reported at 37 µg/l. U.S. EPA human health criteria CTR for cyanide are 700 µg/l (for waters from which both water and aquatic organisms are consumed) and 220,000 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average. U.S. EPA established freshwater aquatic life NTR criteria. The continuous concentration (four-day average) and the maximum concentration (one-hour average) criteria for cyanide are 5.2 µg/l and 22 µg/l, respectively. The maximum detected concentration of cyanide exceeds the freshwater aquatic life NTR criteria. Therefore, it indicates that the discharge from the Beale AFB WWTP does have a reasonable potential to cause or contribute to an exceedance of freshwater aquatic life NTR criteria for cyanide.

The State Board adopted the SIP on 2 March 2000 and amended it on 26 April 2000. The SIP includes methodology for establishing effluent limitations for priority toxic pollutants included in the NTR and CTR. The SIP includes the following equations for calculating the maximum daily and average monthly effluent limitations where applicable water quality criteria are for the protection of freshwater aquatic life:

$LTA_{acute} = ECA_{acute} * ECA\ multiplier_{acute99}$
$LTA_{chronic} = ECA_{chronic} * ECA\ multiplier_{chronic99}$
$AMEL_{aquatic\ life} = LTA_{min}(LTA_{acute}, LTA_{chronic}) * AMEL\ multiplier_{95}$
$MDEL_{aquatic\ life} = LTA_{min}(LTA_{acute}, LTA_{chronic}) * MDEL\ multiplier_{99}$

where

ECA_{acute} = Effluent Concentration Allowance for Acute Condition = 22 µg/l
$ECA_{chronic}$ = Effluent Concentration Allowance for Chronic Condition = 5.2 µg/l

ECA multiplier$_{acute99}$ = Multiplying Factor Adjusted for Effluent Variability (for Acute Condition) = 0.170
ECA multiplier$_{chronic99}$ = Multiplying Factor Adjusted for Effluent Variability (for Chronic Condition) = 0.315
LTA_{acute}, $LTA_{chronic}$ = Long-term Average Discharge Condition for Acute and Chronic Conditions
$AMEL_{aquatic\ life}$ = Average Monthly Effluent Limitation
$MDEL_{aquatic\ life}$ = Maximum Daily Effluent Limitation

Using above equations, average monthly and maximum daily concentration-based Effluent Limitations (presented in total concentration) for cyanide are calculated at 3.5 µg/l and 9.6 µg/l, respectively. In addition, this Order also includes average monthly and maximum daily mass-based Effluent Limitations for cyanide calculated using the equation (*). A time schedule has been included in this Order for compliance with the cyanide limitation.

Dibromochloromethane

Dibromochloromethane is one of the chemicals in the trihalomethanes (THM) group that are formed along with other disinfection by products when chlorine or other disinfectants used to control microbial contaminants in wastewater react with naturally occurring organic and inorganic matter in water. The THM group includes chloroform, bromodichloromethane, dibromochloromethane, and bromoform. Dibromochloromethane poses the most serious cancer risk in the THM group. THM levels tend to increase with pH, temperature, time, and the level of "precursors" present. Precursors are organic material that reacts with chlorine to form THM. The Beale AFB uses chlorine to disinfect its wastewater.

Analytical data provided by the Discharger indicate that the maximum detected effluent concentration of dibromochloromethane was 0.89 µg/l. U.S. EPA established human health CTR criteria of 0.41 µg/l (for waters from which both water and aquatic organisms are consumed) and 34 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average.
The maximum detected effluent concentration of dibromochloromethane exceeds the human health CTR criterion for waters from which both water and aquatic organisms are consumed. Therefore, this Order contains an average monthly concentration-based Effluent Limitation of 0.41 µg/l for dibromochloromethane based on the human health CTR criterion.

The State Board adopted the SIP on 2 March 2000 and amended it on 26 April 2000. The SIP includes methodology for establishing effluent limitations for priority toxic pollutants included in the NTR and CTR. The SIP includes the following equation for calculating the maximum daily effluent limitation when the applicable criteria are for the protection of human health:

$$MDEL_{hh} = ECA * \left(\frac{MDEL}{AMEL} \right)_{multiplier}$$

where

ECA = Effluent concentration allowance
AMEL = Average monthly effluent limitation
AMEL = ECA (for the protection of human health)
$MDEL_{hh}$ = Maximum daily effluent limitation (for the protection of human health)

Using the equation above, the maximum daily concentration-based Effluent Limitation for dibromochloromethane is calculated at 0.8 µg/l. In addition, this Order contains an average monthly and maximum daily mass-based Effluent Limitations of 0.017 lbs/day and 0.033 lbs/day, calculated using the equation (*). A time schedule has been included in this Order for compliance with the dibromochloromethane limitation.

Bromodichloromethane

Bromodichloromethane is a colorless, nonflammable liquid. Most bromodichloromethane is formed as a by-product when chlorine is added to the wastewater to kill bacteria. The Department of Health and Human Services (DHHS) has determined that bromodichloromethane is reasonably anticipated to be a human carcinogen.

U.S. EPA human health CTR criteria for bromodichloromethane are 0.56 µg/l (for waters from which both water and aquatic organisms are consumed) and 46 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average.

Analytical data provided by the Discharger indicate that bromodichloromethane was detected in the effluent at a maximum concentration of 2.7 µg/l. The maximum detected concentration of bromodichloromethane exceeds the human health CTR criterion for waters from which both water and aquatic organisms are consumed. Therefore, the discharge from the Beale AFB WWTP has a reasonable potential to cause or contribute to an exceedance of the CTR criterion. Based on these considerations, this Order contains an average monthly concentration-based Effluent Limitation of 0.56 µg/l for bromodichloromethane based on the human health CTR criterion.

The State Board adopted the SIP on 2 March 2000 and amended it on 26 April 2000. The SIP includes methodology for establishing effluent limitations for priority toxic pollutants included in the NTR and CTR. The SIP includes the following equation for calculating the maximum daily effluent limitation (MDEL) when the applicable criteria are for the protection of human health:

$$MDEL_{hh} = ECA * \left(\frac{MDEL}{AMEL} \right)_{multiplier}$$

where

ECA = Effluent concentration allowance
ECA = Average monthly effluent limitation (for the protection of human health)

AMEL = Average monthly effluent limitation
$MDEL_{hh}$ = Maximum daily effluent limitation (for the protection of human health)

Using the above equation, the maximum daily concentration-based Effluent Limitation for bromodichloromethane is calculated at 1.6 µg/l. In addition, this Order contains monthly average and maximum daily mass-based Effluent Limitations of 0.023 lbs/day and 0.067 lbs/day, calculated using the equation (*). A time schedule has been included in this Order for compliance with the bromodichloromethane limitation.

Di-n-butylphthalate

U.S. EPA human health NTR criteria for di-n-butylphthalate are 2,700 µg/l (for the consumption of both water and aquatic organisms) and 12,000 µg/l (for the consumption of aquatic organisms only) as a 30-day average.

Analytical data provided by the Discharger indicate that di-n-butylphthalate was detected in the effluent at a maximum concentration of 3.0 µg/l. The maximum detected concentration of di-n-butylphthalate in the effluent does not exceed human health NTR criteria. Therefore, no Effluent Limitation for di-n-butylphthalate is included in this Order.

Mercury

Mercury is a neurotoxin, meaning it affects the nervous system. The three most common forms of mercury are elemental, inorganic, and methylmercury. Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts", which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common form of mercury is methylmercury. Methylmercury is produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make. The three forms of mercury can all produce adverse health effects at sufficiently high doses. U.S. EPA has determined that mercuric chloride and methylmercury are possible human carcinogens. Methylmercury and metallic mercury vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, changes in vision or hearing, and memory problems. Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation. U.S. EPA has determined that eating mercury-contaminated fish is the primary route of exposure to mercury for most people.

Human health CTR criteria for mercury are 0.05 µg/l (for waters from which both water and aquatic organisms are consumed) and 0.051 µg/ (for waters from which only aquatic organisms are consumed) as a 30-day average. In 40 CFR Part 131, U.S. EPA acknowledges that human

health criteria may not be protective of some aquatic or endangered species. Both values are controversial and subject to change. In the CTR, U.S. EPA reserved the mercury criteria for fresh water and aquatic life and may adopt new criteria at a later date.

Based on analytical data provided by the Discharger, mercury was detected at a maximum effluent concentration of 0.5 µg/l. Using an average daily flow rate of 0.76 mgd reported in the Report of Waste Discharge and a maximum detected mercury concentration of 0.5 µg/l, the approximate mass of mercury discharged daily is 0.0032 lbs/day. The SIP, Section 1.3, requires the establishment of an effluent limitation when the detected concentration exceeds an applicable criterion or objective. The maximum detected concentration of mercury exceeds human health CTR criteria. This Order contains an average monthly concentration-based Effluent Limitation of 0.05 µg/l for mercury based on the human health CTR criterion for waters from which both water and aquatic organisms are consumed. A monthly average Effluent Limitation of 0.012 µg/l for mercury is included in existing Waste Discharge Requirements, Order No. 98-236. In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(i)(B)(1), the adoption of less stringent effluent limitations for mercury is not considered backsliding since U.S. EPA promulgated the CTR. This Order also contains a mercury interim performance-based mass Effluent Limitation of 1.2 lbs/twelve months for the effluent discharge to Hutchinson Creek. This limitation is based on maintaining the mercury loading at the current level until a total maximum daily load (TMDL) can be established and EPA develops mercury standards that are protective of human health. The mass limitation is derived using the maximum observed effluent mercury concentration of 0.5 µg/l and the reported average daily flow rate of 0.76 mgd. A time schedule has been included in this Order for compliance with the mercury limitation. If U.S. EPA develops new water quality standards for mercury, this permit may be reopened and the Effluent Limitation adjusted. The mass-based Effluent Limitation for mercury is demonstrated as follows:

$$0.5\frac{\mu g}{l} \times 0.76 mgd \times 10^{-3} \times 8.345 \times \frac{365 days}{12 months} = 1.2\frac{lbs}{12 months}$$

Nickel

Analytical data provided by the Discharger indicate that nickel was detected in two of three effluent samples at concentrations of 4.4 µg/l and 4.3 µg/l.

U.S. EPA developed hardness-dependent freshwater aquatic life CTR criteria. U.S. EPA recommended conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for nickel in freshwater are 0.998 and 0.997 for acute and chronic criteria, respectively. The continuous concentration (four-day average) and the maximum concentration (one-hour average) criteria for nickel are presented in total concentrations. These criteria are determined using the following equations:

$$CCC = e^{\{0.846[\ln(hardness)]+0.0584\}} \qquad CMC = e^{\{0.846[\ln(hardness)]+2.255\}}$$

where

CCC = criteria continuous concentration (four-day average)
CMC = criteria maximum concentration (one-hour average)

Since hardness data of the receiving stream were not available, the lowest reported hardness of 100 mg/l collected from the effluent is used to determine the criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average). Using above equations, the hardness-dependent criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average) are calculated at 52 µg/l and 469 µg/l, respectively.

U.S. EPA human health CTR criteria for nickel are 610 µg/l (for waters from which both water and aquatic organisms are consumed) and 4,600 µg/l (for waters from which only aquatic organisms are consumed) as a 30-day average.

Detected concentrations of nickel do not exceed CTR criteria. Therefore, no effluent limitation for nickel is included in this Order.

Pyrene

U.S. EPA human health CTR criteria for pyrene are 960 µg/l (for waters from which both water and aquatic organisms are consumed) and 11,000 µg/ (for waters from which only aquatic organisms are consumed) as a 30-day average.

Analytical data provided by the Discharger indicate that pyrene was detected in the effluent at a maximum concentration of 0.27 µg/l. The maximum detected concentration of pyrene does not exceed human health CTR criteria. Therefore, no effluent limitation for pyrene is included in this Order.

Zinc

Analytical data provided by the Discharger indicate that zinc was detected in four of six effluent samples. Detected concentrations of zinc are summarized in the table below:

Sampling Dates	Reported Concentrations of Zinc (µg/l) (Total Recoverable)
11/27/01	13
9/10/02	10
10/8/02	13
12/10/02	17

U.S. EPA developed hardness-dependent freshwater aquatic life CTR criteria. U.S. EPA recommended conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for zinc in freshwater are 0.978 and 0.986 for acute and chronic criteria, respectively. The continuous concentration (four-day average) and the maximum concentration (one-hour average) criteria for zinc are presented in total concentrations. These criteria are determined using the following equations:

$$CCC = e^{\{0.8473[\ln(hardness)]+0.884\}} \qquad CMC = e^{\{0.8473[\ln(hardness)]+0.884\}}$$

where

CCC = criteria continuous concentration (four-day average)
CMC = criteria maximum concentration (one-hour average)

Since hardness data of the receiving stream were not available, the lowest reported hardness of 100 mg/l collected from the effluent is used to determine the criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average). Using the above equations, both hardness-dependent criteria continuous concentration (four-day average) and the criteria maximum concentration (one-hour average) for zinc are calculated at 120 μg/l.

Detected concentrations of zinc do not exceed CTR criteria. Therefore, no effluent limitation for zinc is included in this Order.

REASONABLE POTENTIAL ANALYSIS FOR EFFLUENT LIMITATIONS – NON-CTR CONSTITUENTS

The reasonable potential analysis is included in the U.S. EPA Technical Support Document for Water Quality-Based Toxics Control (TSD). The analysis assists to determine whether the discharge may: (1) cause, (2) have a reasonable to cause, (3) or contribute to an exceedance of any water quality criteria or objectives. Reasonable potential was determined by calculating the projected maximum effluent concentration (MEC) for each constituent and comparing it to applicable water quality criteria or objective. If the projected MEC exceeded a criterion or objective, the discharge was determined to have reasonable potential to cause or contribute to an exceedance of a water quality criterion or objective for that constituent. The projected MEC is determined by multiplying the maximum detected effluent concentration with a reasonable potential multiplying factor that accounts for statistical variation. The multiplying factor (for 99% confidence level and 99% probability basis) is determined using the number of reported effluent sampling results and the coefficient of variation (CV) of effluent sampling results. For less than 10 effluent data, CV is estimated to equal 0.6. In accordance with the SIP, non-detect results were counted as one-half the detection level when calculating the mean. The reasonable potential analysis is based on the methods used in the TSD.

All maximum detected effluent sampling results, controlling water quality criteria for the receiving water, and calculated projected MEC for non-CTR constituents are summarized in the table below:

Constituents	Maximum Detected Concentration (µg/l)	Number of Samples	Reasonable Potential Multiplying Factor (99% Confidence Level and 99% Probability Basis)	Projected MEC (µg/l)	Controlling Water Quality Criteria (µg/l)	Reasonable Potential?
Aluminum	71	3	5.6	398	Basin Plan narrative toxicity objective and U.S.EPA Ambient Water Quality Freshwater Aquatic Life Criteria	Yes
Barium	120	59	1.6	196	Primary MCL	No
Boron	410	56	1.7	698	Agricultural Goal	No
Calcium	N/A	N/A	N/A	N/A	No Criteria Available	N/A
Chloride	130,000	24	1.5	195,000	Agricultural Goal	No
Chloroform	13	14	4.62	60	Basin Plan narrative objective and Primary MCL	No
Fluoride	800	24	1.7	1,360	Agricultural Goal	No
MBAS	1,200	88	1.66	1,990	Secondary MCL	Yes
Iron	69	3	5.6	386	Basin Plan narrative toxicity objective and Secondary MCL	Yes
Magnesium	27,000	N/A	N/A	N/A	No Criteria Available	N/A
Oil and Grease	11,000	63	1.61	17,661	Basin Plan narrative objective	Yes
Nitrate (as N)	68,000	13	3.57	242,760	Basin Plan narrative objective and Primary MCL	Yes
Nitrite (as N)	330	4	4.7	1,551	Basin Plan narrative objective and Primary MCL	Yes
Phosphorous	2,100	N/A	N/A	N/A	No criteria available	N/A
Potassium	11,000	19	1.6	17,600	No criteria available	N/A
Sulfate	22,000	24	1.4	30,800	Secondary MCL	No
TPHD	560	69	1.57	879	Basin Plan narrative objective and US. EPA SNARL	Yes

The Code of Federal Regulations, 40 CFR 122.44 (d)(1)(iii), states: *"...a discharge causes, has a reasonable potential to cause, or contribute to an in-stream excursion above allowable ambient concentration of a State numeric criteria within a State water quality standard for an individual pollutant, the permit must contain effluent limits for that pollutant.*" The Basin Plan requires, on page III-3.0: *"At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of maximum contaminant levels (MCLs) specified in…Title 22 of the California Code of Regulations, which are incorporated by reference into this plan…"* Municipal and domestic water supply is designated as a beneficial use of the Bear River, which is downstream of Hutchinson Creek. Pursuant to the Basin Plan Tributary Rule, the municipal and domestic water supply beneficial use designation of the Bear River is applied to Hutchinson Creek.

All mass-based Effluent Limitations are calculated using the following equation:

$$X \frac{mg}{l} \times 8.345 \times Flow(mgd) = Y \frac{lbs}{day} \qquad (*)$$

where

X = Concentration-based Effluent Limitation
Y = Mass-based Effluent Limitation

Aluminum

Aluminum occurs naturally and makes up about 8% of the surface of the earth. When aluminum enters the environment, it can dissolve in lakes, streams, and rivers depending on the quality of the water. Studies have shown that infants and adults who received large doses of aluminum developed bone diseases, which suggests that aluminum may cause skeletal problems. Some sensitive people develop skin rashes from using aluminum chlorohydrate deodorants.

Analytical data provided by the Discharger indicate that aluminum was detected in each of the three effluent samples. The maximum detected effluent concentration of aluminum was reported at 71 µg/l. U.S. EPA established Ambient Water Quality freshwater aquatic life criteria of 87 µg/l as a four-day average and 750 µg/l as a one-hour average for aluminum. Using the methodology in the U.S. EPA's Technical Support Document (TSD) for Water Quality-Based Toxics Control, the projected Maximum Effluent Concentration (MEC) of aluminum is calculated at 398 µg/l. Therefore, the discharge from the Beale AFB WWTP has a reasonable potential to cause an exceedance of the Basin Plan narrative toxicity objective. This Order includes concentration-based Effluent Limitations for aluminum based on the Basin Plan narrative toxicity objective utilizing the EPA's recommended Ambient Criteria.

The U.S. EPA TSD recommends converting acute (one-hour average) and chronic (four-day average) aquatic life criteria to maximum daily and average monthly effluent limitations. Conversions are demonstrated in the following equations:

$$LTA_{ac} = WLA_{ac} \times \exp\left(0.5\sigma^2 - z\sigma\right)$$
$$LTA_c = WLA_c \times \exp\left(0.5\sigma_4{}^2 - z\sigma_4\right)$$
$$LTA = \min\left(LTA_C, LTA_{ac}\right)$$
$$AMEL = LTA \times \exp\left(z\sigma_n - 0.5\sigma_n{}^2\right)$$
$$MDEL = LTA \times \exp\left(z\sigma - 0.5\sigma^2\right)$$

where

LTA_{ac} = Acute long-term average wasteload in chronic units
LTA_c = Chronic long-term average wasteload
WLA_{ac} = Acute wasteload allocation in chronic toxic units
LTA = Long-term average
σ = Standard deviation
AMEL = Average monthly effluent limitation
MDEL = Maximum daily effluent limitation

Using above equations, maximum daily and average monthly concentration-based Effluent Limitations for aluminum are calculated at 143 µg/l and 71 µg/l.

In addition, this Order contains four-day average, one-hour average, maximum daily, and average monthly mass-based Effluent Limitations of 3.6 lbs/day, 31.3 lbs/day, 6.0 lbs/day, and 3.0 lbs/day, respectively. Mass-based Effluent Limitations are calculated using the equation (*).

Ammonia

Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate, and denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification process to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream.

In water, un-ionized ammonia (NH_3) exists in equilibrium with the ammonium ion (NH_4^+). The toxicity of aqueous ammonia solutions to aquatic organisms is primarily attributable to the un-ionized ammonia form, with the ammonium ion being relatively less toxic. Total ammonia refers to the sum of these two forms in aqueous solutions. Analytical methods are used to directly determine the total ammonia concentration, which is then used to calculate the un-ionized ammonia (toxic) concentration in water.

U.S. EPA's Ambient Water Quality criteria for the protection of freshwater aquatic life include the acute (one-hour average) standard based on pH and chronic (30-day average) standard based on pH and temperature. U.S. EPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids are more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia as not influenced by the temperature, it

has been found that inverterbrates and young fish experienced increasing chronic toxicity effects with increasing temperature. U.S. EPA has presented the acute ammonia criteria in three ways: as equations, in a table, and in graphs that relate pH to ammonia concentrations. Warm and cold freshwater aquatic habitat is designated as beneficial uses of the Bear River, which is downstream from Hutchinson Creek. Pursuant to the Basin Plan Tributary Rule, the warm and cold freshwater aquatic habitat beneficial use also applied to Hutchinson Creek. In fact, Department of Fish and Game staff has verified the presence of adult salmonids and juvenile non-natal rearing fishes in Hutchinson Creek. Attachments B and C show the equation and table used for the 30-day and one-hour average concentration criteria recommended for waters where salmonid fish are present.

The discharge from the Beale AFB WWTP has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan narrative toxicity objective. Therefore, this Order includes 30-day average, four-day average, and one-hour average concentration-based Effluent Limitations for ammonia based on the Basin Plan narrative toxicity objective. In addition, this Order includes mass-based Effluent Limitations calculated using the equation (*).

Barium

Analytical data provided by the Discharger indicate that barium was detected in 6 of 59 effluent samples. The maximum detected effluent concentration of barium was reported at 120 µg/l. The average detected effluent concentration of barium in a five-year period is 6.8 µg/l.

U.S. EPA and the Department of Health Service established a Primary MCL of 2,000 µg/l and 1,000 µg/l for barium, respectively. An Effluent Limitation for barium is included in existing Waste Discharge Requirements, Order No. 98-236, based on the Primary MCL.

Using the TSD reasonable potential analysis, the projected MEC of barium is calculated at 196 µg/l. Therefore, it indicates that the discharge does not have a reasonable potential to cause an exceedance of water quality criteria for barium.

In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(i)(B)(1), the adoption of less stringent effluent limitations for barium is not considered backsliding if information is available which was not available at the time of permit issuance. New effluent sampling results indicated that there was no reasonable potential to exceed water quality criteria for barium.

In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(ii), a permit to discharge to surface waters may not be renewed with a less stringent effluent limitation, if implementation of the limitation would result in violation of a water quality standard. The TSD reasonable potential analysis for barium indicated that, statistically, the projected maximum effluent concentration does not exceed any water quality criteria.

This Order does not contain an Effluent Limitation for barium.

Boron

Analytical data provided by the Discharger indicate that boron was detected in 42 of 56 effluent samples. The maximum detected effluent concentration of boron was reported at 410 µg/l. The average detected effluent concentration of in a five-year period is 141 µg/l.

The Agricultural Water Quality Goal for boron is 700 µg/l. A monthly average Effluent Limitation of 1,000 µg/l for boron is included in existing Waste Discharge Requirements, Order No. 98-236.

Using the TSD reasonable potential analysis, the projected MEC of boron is calculated at 698 µg/l. Therefore, the reasonable potential analysis indicates that the discharge does not have a reasonable potential to cause an exceedance of the Agricultural Water Quality goal for boron.

In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(i)(B)(1), the adoption of less stringent effluent limitations for boron is not considered backsliding if information is available which was not available at the time of permit issuance. New effluent sampling results indicated that there was no reasonable potential for boron to exceed the Agricultural Water Quality goal.

In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(i)(B)(2), the adoption of less stringent effluent limitations for boron is not considered backsliding if technical mistakes were made in issuing the permit. The Effluent Limitation for boron in existing Order No. 98-236 does not appear to be based on water quality standards and no calculations were shown for establishing water quality based Effluent Limitation.

In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(ii), a permit to discharge to surface waters may not be renewed with a less stringent effluent limitation, if implementation of the limitation would result in violation of a water quality standard. The reasonable potential analysis for boron indicated that, statistically, the projected maximum effluent concentration does not exceed the Agricultural Water Quality goal for boron.

This Order does not contain an Effluent Limitation for boron.

Total Trihalomethanes and Chloroform

Analytical data provided by the Discharger indicate that chloroform was detected in 9 of 14 effluent samples. The maximum detected effluent concentration of chloroform was reported at 13 µg/l. Chloroform is included in the CTR. However, no CTR criteria for chloroform have yet been established. Therefore, the reasonable potential analysis for non-CTR constituents is applied to chloroform to determine whether chloroform causes or has a reasonable potential to cause an exceedance of a water quality criterion or objective. Using the TSD reasonable potential analysis, the projected MEC of chloroform is calculated at 60 µg/l.

Municipal and domestic water supply is a beneficial use of the Bear River, which is downstream from Hutchinson Creek. Pursuant to the Basin Plan Tributary Rule, the municipal and domestic water supply beneficial use is applied to Hutchinson Creek. The narrative toxicity objective and the municipal and domestic water supply beneficial use designation comprise a water quality standard applicable to pollutants in the receiving stream. The Basin Plan contains the *Policy for Application of Water Quality Objectives*, which provides that narrative objectives may be translated using numerical limits published by other agencies and organizations. The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including chloroform, that have been used as a basis for regulatory actions by the boards, departments and offices within Cal/EPA. The OEHHA cancer potency value for oral exposure to chloroform is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard toxicologic assumptions used by OEHHA and U.S. EPA in evaluating health risks via drinking water exposure of 70 kg body weight and 2 liters per day water consumption, this cancer potency factor is equivalent to a concentration in drinking water of 1.1 ug/L (ppb) at the one-in-a-million cancer risk level. This risk level is consistent with that used by the DHS to set *de minimus* risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water. The one-in-a-million cancer risk level is also mandated by U.S.EPA in applying human health protective criteria contained in the NTR and the CTR to priority toxic pollutants in California surface waters. Since no drinking water intakes have been recorded downstream of the discharge from the Beale AFB WWTP; therefore, setting a chloroform effluent limitation based on a cancer risk analysis is not appropriate. The Primary MCL for total trihalomethanes, the sum of bromoform, bromodichloromethane, chloroform, and dibromochloromethane, is 80 µg/l. The projected MEC of chloroform does not exceed the Primary MCL; therefore, it indicates that the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the water quality objective for municipal uses. No Effluent Limitation for total trihalomethanes is included in this Order. If U.S. EPA or the State Board develops a water quality objective for chloroform and/or total trihalomethanes, this Order may be reopened and a new Effluent Limitation added.

Fluoride

U.S. EPA and California DHS established a Primary MCL for fluoride of 4,000 µg/l and 2,000 µg/l, respectively. The Secondary MCL for fluoride is 2,000 µg/l. The Agricultural Water Quality Goal for fluoride is 1,000 µg/l.

Analytical data provided by the Discharger indicate that fluoride was detected in 23 of 24 effluent samples. Detected effluent concentrations of fluoride ranged from 260 µg/l to 800 µg/l. The average detected effluent concentration of fluoride in a five-year period is 506 µg/l. Since detected effluent concentrations of fluoride do not exceed any water quality criteria, it indicates that the discharge from the Beale AFB WWTP does not present a reasonable potential to cause an in-stream excursion above the water quality objective for municipal uses or agricultural uses. Therefore, no Effluent Limitation for fluoride is included in this Order.

Iron

Iron is an abundant element in the earth's crust. It is believed to be the major component of the earth's core. Several studies have shown that high iron content in the body linked to cancer and heart disease. Iron can be poisonous and if high dose of iron is taken over a long period, it could result in liver and heart damage, diabetes, and skin changes.

Analytical data provided by the Discharger indicate that iron was detected in each of the three effluent samples. The maximum detected effluent concentration of iron was reported at 69 µg/l. Using the TSD reasonable potential analysis, the projected MEC of iron in the effluent is calculated at 386 µg/l. The current Secondary MCL for iron is 300 µg/l.

The projected MEC of iron exceeds the Secondary MCL. Municipal and domestic water supply is designated as a beneficial use of the Bear River, which is downstream of Hutchinson Creek. Pursuant to the Basin Plan Tributary Rule, the municipal and domestic water supply beneficial use is applied to Hutchinson Creek. To protect the municipal and domestic water supply beneficial use, this Order includes a monthly average concentration-based Effluent Limitation for iron based on the Basin Plan chemical constituents objective at the Secondary MCL of 300 µg/l. In addition, this Order contains a mass-based Effluent Limitation of 12.5 lbs/day, calculated using the equation (*).

Methylene Blue Active Substances (MBAS)

Analytical data provided by the Discharger indicate that MBAS was detected in 62 of 88 effluent samples. The maximum detected effluent concentration of MBAS was reported at 1,200 µg/l. Using the TSD reasonable potential analysis, the projected MEC for MBAS is calculated at 1,990 µg/l.

The current Secondary MCL for MBAS is 500 µg/l. The existing permit contains a monthly average Effluent Limitation, based on the Secondary MCL of 500 µg/l, and a daily maximum Effluent Limitation of 1,000 µg/l for MBAS. The maximum detected concentration of MBAS in the effluent exceeds the monthly average and the daily maximum Effluent Limitations contained in the existing permit. Therefore, MBAS has violated and presents a reasonable potential to cause or contribute to an exceedance of permit limitations. Monthly average and daily maximum concentration-based Effluent Limitations as contained in the existing permit are continued in this Order. In addition, this Order contains monthly average and daily maximum mass-based Effluent Limitations of 20.9 lbs/day and 41.7 lbs/day, respectively, calculated using the equation (*).

Oil and Grease and Total Petroleum Hydrocarbons

Analytical data provided by the Discharger indicate that total petroleum hydrocarbons as diesel (TPHD), total petroleum hydrocarbons as motor oil (TPHO), and n-hexane extractable material (total oil and grease) were detected in the effluent at maximum concentrations of 560 µg/l, 1,500 µg/l, and 11,000 µg/l, respectively.

U.S. EPA recommended a Drinking Water Health suggested no-adverse-response level (SNARL) of 100 µg/l for an exposure of 10 days or less for TPHD and 5.0 µg/l for total petroleum hydrocarbons as gasoline (TPHG). The taste and odor threshold for TPHG is 5.0 µg/l. The Basin Plan includes a water quality objective for oil and grease and floating material in surface waters, which state: "Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses" and that: "Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses". The antidegradation provisions of the State Water Resources Control Board, Resolution No. 68-16 states that: "Any activities which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained". The existing permit includes monthly average and daily maximum Effluent Limitations of 100 µg/l and 200 µg/l, respectively, for TPHD and monthly average, weekly average, and daily maximum Effluent Limitations of 10 mg/l, 15 mg/l, and 20 mg/l, respectively, for oil and grease. Detected concentrations of TPHD, TPHO, and total oil and grease in the effluent indicate that the discharge has a reasonable potential to cause an exceedance of Basin Plan narrative objectives for oil and grease and floating material and SWRCB Resolution No. 68-16 (antidegradation policy). Concentration and mass discharges of total oil and grease can be controlled through an implementation of an effective pretreatment program. Municipal and domestic water supply is designated as a beneficial use of the Bear River. Pursuant to the Basin Plan Tributary Rule, the municipal and domestic water supply beneficial use is applied to Hutchinson Creek. Therefore, to protect the municipal and domestic water supply beneficial use, this Order includes a monthly average Effluent Limitation for total petroleum hydrocarbons based on the Basin Plan chemical constituents objective and antidegradation policy (SWRCB Resolution No. 68-16) utilizing the taste and odor threshold of 5.0 µg/l. This Order also includes monthly average and daily maximum Effluent Limitations of 10 mg/l and 15 mg/l, respectively, for oil and grease based on the antidegradation policy (SWRCB Resolution No. 68-16).

Nitrate (as N)

Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate, and denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification process to remove ammonia from the waste stream. Inadequate or incomplete nitrification or denitrification may result in the discharge of ammonia or nitrate to the receiving stream. Nitrate is one of the important nutrients for algae. An excess nitrate may cause the rapid growth of algae. The algae population becomes an extreme and algae dies. Decomposition occurs using much oxygen and other aquatic organisms also die and decompose. This condition is known as eutrophication and the ecological balance has been destroyed. Recent toxicity studies have indicated that a possibility that nitrate is toxic to aquatic organisms.

Analytical data provided by the Discharger indicate that nitrate (as N) was detected in each of 13 effluent samples. The maximum detected effluent concentration of nitrate (as N) was reported at 68,000 µg/l. Using the TSD reasonable potential analysis, the projected MEC of nitrate is calculated at 242,760 µg/l. The Basin Plan on page III-3.0, states: "Water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses". U.S. EPA has developed a Primary MCL of 10,000 µg/l for nitrate (as N).

The maximum detected concentration of nitrate exceeds the Basin Plan narrative prohibition against the discharge of biostimulating constituents and the Primary MCL. Municipal and domestic water supply is designated as a beneficial use of the Bear River, which is downstream of Hutchinson Creek. Pursuant to the Basin Plan Tributary Rule, the municipal and domestic water supply beneficial use is applied to Hutchinson Creek. To protect the municipal and domestic water supply beneficial use, this Order includes a concentration-based Effluent Limitation of 10,000 µg/l for nitrate based on the Primary MCL. In addition, this Order contains a mass-based Effluent Limitation of 417 lbs/day, calculated using the equation (*).

Nitrite (as N)

Analytical data provided by the Discharger indicate that nitrite was detected in 3 of 4 effluent samples. The maximum detected effluent concentration of nitrite (as N) was reported at 330 µg/l. Using the TSD reasonable potential analysis, the projected MEC of nitrite is calculated at 1,551 µg/l.

U.S. EPA and California DHS developed a Primary MCL of 1,000 µg/l for nitrite (as N). The projected MEC of nitrite exceeds the Basin Plan chemical constituents objective. Municipal and domestic water supply is designated as a beneficial use of the Bear River, which is downstream of Hutchinson Creek. Pursuant to the Basin Plan Tributary Rule, the municipal and domestic beneficial use is applied to Hutchinson Creek. To protect the municipal and domestic beneficial use, this Order includes a concentration-based Effluent Limitation of 1,000 µg/l for nitrite based on the Primary MCL. In addition, this Order contains a mass-based Effluent Limitation of 41.7 lbs/day, calculated using the equation (*).

Sulfate

Analytical data provided by the Discharger indicate that sulfate was detected in each of the 24 effluent samples. The maximum detected effluent concentration of sulfate was reported at 22,000 µg/l. Using the TSD reasonable potential analysis, the projected MEC of sulfate is calculated at 30,800 µg/l. The current Primary and Secondary MCLs for sulfate are 500,000 µg/l and 250,000 µg/l, respectively.

The projected MEC of sulfate does not exceed any water quality criteria. Therefore, no Effluent Limitation for sulfate is included in this Order.

Total Coliform Organisms

Total coliform bacteria is a group of bacteria that includes fecal coliforms and other non-fecal bacteria. Escherichia coli (E.coli) is a specific kind of fecal coliform that is found in human and other mammal waste. Some of the health risks associated with fecal-contaminated water are gastroenteritis, ear infections, typhoid fever, dysentery, and hepatitis. The presence of coliform suggests contamination of the water supply that may include such harmful microorganisms giardia and cryptosporidium as well as others.

The existing permit includes total coliform organisms effluent limitations of 23 MPN/100 ml and 230 MPN/100 ml as the monthly median and daily maximum concentrations, respectively. These effluent limitations are continued in this Order. The California Department of Health Services (DHS) has developed reclamation criteria, California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 ml as a 7-day median. Title 22 is not directly applicable to surface waters; however, the Regional Board finds that it is appropriate to apply DHS's reclamation criteria because agricultural irrigation beneficial use is applied to Hutchinson Creek pursuant to the Tributary Rule. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS. Therefore, from **1 April 2009** forward, Effluent Limitations based on the tertiary treatment standards are included in this Order to protect the beneficial uses of nonrestricted contact recreation and irrigation in the Bear River, downstream from Hutchinson Creek.

BOD and TSS

Biochemical oxygen demand (BOD) is a measure of the amount of oxygen that bacteria will consume while decomposing the organic matter under aerobic condition. BOD measurements are used as a measure of the organic strength of waste in water.

Total suspended solids (TSS) are solids in water that can be trapped by a filter. Total suspended solid is a parameter use to measure water quality as a concentration of mineral and organic sediment. TSS can include a wide variety of material, such as silt, decaying plant and animal matter, industrial wastes, and sewage. High concentrations of suspended solids can cause many problems for stream health and aquatic life.

High TSS can block light from reaching submerged vegetation. As the amount of light passing through the water is reduced, photosynthesis slows down. Reduced rates of photosynthesis cause less dissolved oxygen to be released into the water by plans. If light is completely blocked from bottom dwelling plants, the plants will stop producing oxygen and will die. As the plants are decomposed, bacteria will use up even more oxygen from the water. Low dissolved oxygen can lead to fish kills. High TSS can also cause an increase in surface water temperature, because

the suspended particles absorb heat from sunlight. This can cause dissolved oxygen levels to fall even further and can harm aquatic life in many other ways.

40 Code of Federal Regulations (CFR), Section 133.102 contains regulations describing the minimum level of effluent quality for BOD and TSS based on the secondary treatment standards. These standards continued to be applied in the Order No. R5-2004-0045.

From **1 April 2009** forward, the Discharger shall be required to comply with effluent limitations established based on the tertiary treatment or equivalent treatment standards. Effluent limitations for BOD and TSS have been established at 10 mg/l, 15 mg/l, and 20 mg/l as a 30-day average, weekly average, and daily maximum based on the capability of the tertiary treatment system.

Settleable Solids

For inland surface waters, the Basin Plan states that "[w]ater shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses." Order No. R5-2004-0045 contains average monthly and average daily effluent limitations for settleable solids.

Total Chlorine Residual

Chlorine is commonly used as a disinfection agent in the treatment of the wastewater. Proper disinfection ensures destruction of pathogens prior to discharge to the surface waters. The Discharger uses chlorine for disinfection of wastewater at the treatment plant. Chlorine can cause toxicity to aquatic organisms when discharged to surface waters. The use of chlorine as a disinfectant presents a reasonable potential that it could be discharged in toxic concentrations. Chlorine combines with natural organic matter to form potent, cancer-causing compounds known as trihalomethanes. For dechlorination, the Discharger uses sulfur dioxide, which combines with chlorine, to render it relatively unreactive and thus removes it from the waste stream. Inadequate dechlorination may result in the discharge of chlorine to the receiving stream and cause toxicity to aquatic life. The Basin Plan narrative toxicity objective requires that: "All waters be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal or aquatic life."

U.S. EPA has developed Ambient Water Quality criteria for the protection of freshwater aquatic life. The recommended maximum one-hour average and four-day average concentrations for chlorine are 0.02 mg/l and 0.01 mg/l, respectively. Analytical data provided by the Discharger indicate that chlorine was detected in the effluent at a maximum concentration of 0.57 mg/l, which is 57 times greater than the Ambient Water Quality criterion for four-day average condition. This Order includes a one-hour average Effluent Limitation of 0.02 mg/l and four-day average Effluent Limitation of 0.01 mg/l for chlorine based on the Basin Plan narrative toxicity objective utilizing Ambient Water Quality criteria. In addition, this Order contains mass-based Effluent Limitations of 0.83 lbs/day (as an one-hour average) and 0.42 lbs/day (as a four-day average), calculated using the equation (*).

Electrical Conductivity, Chloride, and Sodium

- Electrical Conductivity (EC):

  EC measures the ability of the water sample to carry an electrical current, a property which is proportional to the concentration of ions in solution. Domestic and industrial uses of water, result in an increase in the mineral content of the wastewater. The salinity of the wastewater is determined by measuring EC. When salts dissolve in water, ions are formed and the solution will conduct electricity. EC increases with salinity because of the increasing presence of ions.

  The Agricultural Water Quality goal for EC is 700 µmhos/cm. The Basin Plan states, on Page III-3.00 Chemical Constituents, that "Waters shall not contain constituents in concentrations that adversely affect beneficial uses."

  Analytical data provided by the Discharger indicate that EC was detected above the Agricultural Water Quality Goal in 1 of 50 effluent samples. This concentration was reported at 720 µmhos/cm on 19 October 1999. The average concentration of EC in the effluent in a five-year period is 513 µmhos/cm. The wastewater discharge does not present a reasonable potential to cause adversely effect to the Agricultural irrigation beneficial use of the receiving stream. Therefore, no Effluent Limitation for EC is included in this Order.

- Chloride and Sodium:

  Analytical data provided by the Discharger indicate that chloride and sodium were detected in the effluent at concentrations ranged from 23,000 µg/l to 130,000 µg/l and 19,000 µg/l to 78,000 µg/l, respectively. The average detected effluent concentrations of chloride and sodium in a five-year period are 72,000 µg/l and 55,842 µg/l, respectively. The current Secondary MCL for chloride is 250,000 µg/l. The Agricultural Water Quality Goal for chloride is 106,000 µg/l. U.S. EPA established Ambient Water Quality criteria for the protection of freshwater aquatic life. Criteria for the four-day average and the one-hour average conditions for chloride are 230,000 µg/l and 860,000 µg/l, respectively. The Agricultural Water Quality Goal for sodium is 69,000 µg/l.

  Sodium chloride consists of sodium ions (Na^+) and chloride ions (Cl^-) held together in a crystal. In water, sodium chloride breaks apart into an aqueous solution of sodium and chloride ions. This solution will conduct an electric current. Because dissolved ions in water increase conductivity, the measures of sodium and chloride ions and EC are related. Effectively control the level of EC will result in less amount of chloride and sodium in the effluent. Analytical data provided by the Discharger indicate that 22 of 24 effluent sampling results for chloride and 15 of 19 effluent sampling results for sodium were detected below Agricultural Water Quality Goals. In addition, EC was detected below the Agricultural Water Quality goal in 49 of 50 effluent samples. There was only one effluent sample that had a concentration of EC at 720 µmhos/cm. Therefore, it indicates that the wastewater discharge does not present a reasonable potential to cause

an adversely effect to the Agricultural irrigation beneficial use of the receiving stream for chloride and sodium. No Effluent Limitations for chloride and sodium are included in this Order.

Flow

The design average dry weather flow capacity of the wastewater treatment plan is 5.0 mgd. Therefore, the influent flow limit is established at 5.0 mgd.

pH

For all surface water bodies in the Sacramento River and San Joaquin River basins, the Basin Plan includes a water quality objective for pH in surface waters, which states " *The pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh water with designated COLD and WARM beneficial uses*." At times, Hutchinson Creek provides insignificant dilution for the effluent discharged from the wastewater treatment plant. The effluent limitation for pH included in this Order will be based on the water quality objective described in the Basin Plan.

Toxicity

The Basin Plan states that "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances." The Basin Plan requires that "as a minimum, compliance with this objective…shall be evaluated with a 96-hour bioassay." Order No. R5-2004-0045 requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective. The Basin Plan also states: "…effluent limits based upon acute biotoxicity tests of effluents will be prescribed…". Effluent limitations for acute toxicity are included in the Order.

RECEIVING WATER LIMITATIONS AND MONITORING

Dissolved Oxygen

Warm and cold freshwater aquatic habitat is designated as a beneficial use of the Bear River, downstream from Hutchinson Creek. Pursuant to the Basin Plan Tributary Rule, warm and cold freshwater aquatic habitat beneficial use is applied to Hutchinson Creek. In fact, the California Department of Fish and Game (DFG) has recorded the presence of adult salmonids and juvenile non-natal rearing in Hutchinson Creek and the Western Pacific Interceptor Drainage Canal and anadromous fish species in Reeds Creek, a tributary to the Western Pacific Interceptor Drainage Canal. For water bodies designated as having cold freshwater aquatic habitat as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/l of dissolved oxygen. The current permit includes a limitation of 5.0 mg/l for dissolved oxygen.

Since cold freshwater fish is an actual beneficial use of the receiving water and as required in the Basin Plan for the protection of cold freshwater aquatic habitat beneficial use, this Order contains a new receiving water limitation of 7.0 mg/l for dissolved oxygen.

For surface water bodies outside of the Delta, the Basin Plan requires that "…the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation." This objective is included as a receiving water limitation in the Order.

pH

For all surface water bodies in the Sacramento River and San Joaquin River basins, the Basin Plan includes a water quality objective for pH in surface waters, which states: " The pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh water with designated COLD and WARM beneficial uses." Both warm and cold freshwater aquatic habitats are designated as beneficial uses of the Bear River, which is downstream from Hutchinson Creek. Therefore, warm and cold freshwater aquatic habitat beneficial use is applied to Hutchinson Creek pursuant to the Basin Plan Tributary Rule. This Order includes receiving water limitations for pH based on the water quality objective described in the Basin Plan.

Temperature

The Basin Plan includes the following objective: "At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5ºF above natural receiving water temperature." Warm and cold freshwater aquatic habitat has been designated as beneficial use of the Bear River, which is downstream from Hutchinson Creek. Therefore, warm and cold freshwater aquatic habitat beneficial use is also applied for Hutchinson Creek pursuant to the Basin Plan Tributary Rule. This Order includes receiving water limitations for temperature based on the water quality objective described in the Basin Plan.

Turbidity

The Basin Plan states that: "Waters shall be free of changes in turbidity that cause nuisance or adversely effect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 10 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTU.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent."

This Order includes receiving water limitations for turbidity based on the water quality objective described in the Basin Plan.

Toxicity

The Basin Plan states that "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances." The Basin Plan requires that "as a minimum, compliance with this objective…shall be evaluated with a 96-hour bioassay." Order No. R5-2004-0045 requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective. The Basin Plan also states: "…effluent limits based upon acute biotoxicity tests of effluents will be prescribed…". Effluent limitations for acute toxicity are included in the Order.

GENERAL EFFLUENT LIMITATION INFORMATION

Selected 40 CFR §122.2 definitions:

'*Average monthly discharge limitation* means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a
calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities.

Daily discharge means the "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonable represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum daily discharge limitation means the highest allowable "daily discharge".'

The SIP contains similar definitions. These definitions were used in the development of Order No. R5-2003-0085. Alternate limitation period terms were used in the permit for the sake of clarity. Alternates are shown in the following table:

Term Used in Permit	SIP/40 CFR 122.2 Term
Average monthly	Average monthly discharge limitation. 30-day averages may have been converted to monthly averages to conform with 40 CFR §122.45 (see below)
Average daily	Maximum daily discharge limitation. Since the daily discharge for limitations expressed in concentrations is defined as the average measurement of the pollutant over the day, the term 'Average Daily' was used in the Order.

40 CFR §122.45 states that:

(1) "In the case of POTWs, permit effluent limitations…shall be calculated based on design flow."

(2) "For continuous discharges all permit effluent limitations…shall unless impracticable be stated as…[a]verage weekly and average monthly discharge limitations for POTWs."

(3) "All pollutants limited in permits shall have limitations…expressed in terms of mass except…[f]or pH, temperature, radiation, or other pollutants which cannot appropriately be expressed by mass…Pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permitee to comply with both limitations."

U.S. EPA recommends a maximum daily limitation rather than an average weekly limitation for water quality based permitting.

No recommended or approved methods have been provided for converting human health and four-day and one-hour toxicity criteria, standards, and objectives to weekly average effluent limitations; therefore, the conversion to weekly average limitations is impracticable.

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